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THE

EDINBURGH MEDICAL AND SURGICAL JOURNAL:

EXHIBITING

A CONCISE VIEW

OF THE

LATEST AND MOST IMPORTANT DISCOVERIES

IN

MEDICINE, SURGERY, AND PHARMACY.

VOLUME FORTY-SECOND.
1834.

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2. C. F. Bellingeri De Medulla Spinali.

3. Ragionamenti, Sperienze ed Osservazione Patologiche comprovanti l'Antagonismo Nervoso, esposti e Raccolte da Carlo Francisco Bellingeri, Medico Della Real Corte Pel Solo Titolo, Preside della Facolta Medica Nella R. Universita, &c. . . 111

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The following publications have been received:—

The Anatomy and Surgery of Inguinal and Femoral Hernia. Illustrated by Plates, coloured from Nature. By E. W. Tuson, F. L. S. Assistant-Surgeon to the Middlesex Hospital, &c. London, 1834. Imperial Folio.

The Signs, Disorders, and Management of Pregnancy; the Treatment to be adopted during and after Confinement; and the Management and Disorders of Children. By Douglas Fox, Member of the Royal College of Surgeons, &c. Derby, 1834. 8vo.

Essai sur la Leucorrhée et les Causes diverses qui la produisent. Par A. M. Bureaud Riofrey, Docteur en Medecine de la Faculte de Paris, &c. &c. A Londres, 1834. 12mo.

An Introduction to the Study of Human Anatomy. By James Paxton, Member of the Royal College of Surgeons in London, &c. &c. London, 1834. Vol. ii. 8vo.

The Anatomy of the Human Eye. By John Dalrymple, Assistant-Surgeon to the London Ophthalmic Infirmary. London, 1834. 8vo.

A Compendious History of Small-Pox, &c. &c. By Henry George, Surgeon, Surgeon Extraordinary to His Royal Highness the Duke of Gloucester. London, 1833. 8vo.

A New Synopsis of Nosology, founded on the Principles of Pathological Anatomy, &c. By G. Hume Weatherhead, M. D. Member of the Royal College of Physicians, &c. &c. London, 1834. 12mo.

Observations on the Present System of Medical Education, with a view to Medical Reform. By a Licentiate of the Royal College of Physicians of London. London, 1834. 8vo.

On the Motions of the Earth and Heavenly Bodies, as explainable by Electro-Magnetic Attraction and Repulsion; and on the Conception, Growth, and Decay of Man, and Cause and Treatment of his Diseases, as referable to Galvanic Action. By P. Cunningham, Surgeon, Royal Navy. London, 1834. 12mo.

The Principles of Physiology applied to the Preservation of Health, and to the Improvement of Physical and Mental Education. By Andrew Combe, M. D. Fellow of the Royal College of Physicians of Edinburgh. Edinburgh, 1834. 12mo.

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An Introductory Lecture on Diseases of the Eye, delivered at the Birmingham Eye Infirmary. By Richard Middlemore, Member of the Royal College of Surgeons, &c. Birmingham, 1834. 8vo.

Pharmacopœia Homœopathica. Edidit F. F. Quin, M. D., Medicus Ordinarius Leopoldi Primi Regis Belgarum, &c. &c. London, 1834. 8vo.

The Dispensatory of the United States of America. By George D. Wood, M. D. Professor of Materia Medica and Pharmacy in the Philadelphia College of Pharmacy, &c.; and Franklin Bache, M. D. Professor of Chemistry in the Philadelphia College of Pharmacy, &c. Second Edition, enlarged and carefully Revised. Philadelphia, 1834. 8vo. Pp. 1162.

Traité Theorique et Pratique des Blessures, par Armes de Guerre, Redigé d'Apres les Lecons Cliniques, De M. Le Baron Dupuytren, Chirurgien en chef de l'Hotel-Dieu, et Publié sous sa Direction. Par MM. les Docteurs A. Paillard et Marx. Paris, 1834. Tome Premier. 8vo.

Des Convulsions chez Les Femmes pendant la Grossesse, pendant la Travail, et apres l'Accouchement. Par A. Velpeau, Chirurgien de l'Hopital de La Pitié. Paris, 1834. 8vo.

A New System of Organic Chemistry, Translated from the French of F. V. Raspail, with Notes and Additions. By William Henderson, M. D. Lecturer on Materia Medica in the Universities of Aberdeen. London, 1834. 8vo.

The Transactions of the Provincial Medical and Surgical Association. London, 1834. Vol. ii. 8vo.

Transactions of the Medical and Physical Society of Calcutta. Calcutta, 1833. Vol. vi. 8vo.

London Medical Gazette for the Session 1833-34. From No. 28, April 12, to No. 36, June 7, 1834.

London Medical and Surgical Journal. From No. 118, May 3, 1834, to No. 123, Vol. v. June 7, 1834.

Dublin Journal of Medical and Chemical Sciences, No. xiv. May 1834.

ERRATUM.

We take this opportunity of correcting a typographical error which has been admitted in the translation of M. Lugol's work on Iodine. In the formula in our review of that work, mentioned at p. 407, Vol. xl. the quantity of water, in order to afford the requisite strength, ought to be seven drachms only, and not seven ounces, as there stated. The error was occasioned by the symbols in the translation, ℥vii. instead of ʒ vii.

⁂ Communications, Books, and Memoirs for this Journal, addressed to the EDITOR, to be forwarded through Messrs LONGMAN and Co. London, or Messrs A. and C. BLACK, Edinburgh.

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2. C. F. Bellingeri De Medulla Spinali.

3. Experimenta in Nervorum Antagonismum, habita a Carolo Francisco Bellingeri. Lecta die 22 Februarii 1824.

4. Experimenta Physiologica in Medullam Spinalem, habita a Carolo Francisco Bellingeri. Lecta die 13 Junii 1824.

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A Dictionary of Terms, employed by the French in Anatomy, Physiology, Pathology, &c.; with their Derivations from the Greek and Latin; their Synonyms in the Greek, Latin, French, German, &c. By Shirley Palmer, M. D. Part I. Birmingham, 1834. 8vo.

Some Observations on the Preparation and Medicinal Employment of the Ioduret and Hydriodate of Iron. By Anthony Todd Thomson, M. D. Lond. 1834. 8vo.

Fragmenta de Viribus Medicamentorum Positivis, sive in sano Corpore Humano observatis. A Samuele Hahnemann, M. D., &c. Edidit F. F. Quin, M. D. Lond. 1834. 8vo.

An Essay on the Relation of the Theory of Morals to Insanity. By T. Mayo, M. D. Lond. 1834. 8vo.

The Nervous System, Anatomical and Physiological; in which the Functions of the various parts of the Brain are, for the first time, assigned, &c. By Alexander Walker, Author of Physiognomy founded on Physiology. Lond. 1834. 8vo.

Description of an Apparatus intended to facilitate the Treatment of Fractures of the Lower Extremity. By T. M. Greenhow, Member of the Royal College of Surgeons in London, &c. &c. Lond. 1833. 8vo.

Illustrations of the Natural History of Worcestershire; with information on the Statistics, Zoology, and Geology of the County; including also a short account of its Mineral Waters. By Charles Hastings, M. D. Lond. 1834. 8vo.

A Dictionary of Practical Medicine: Comprising General Pathology, the Nature and Treatment of Diseases, Morbid Structures, and the Disorders especially incidental to Climates, to the Sex, and to the different epochs of Life, &c. By James Copland, M. D., &c. &c. Part ii. Lond. 1833. 8vo.

Parallele entre La Taille et la Lithotritie. Par Ph.-Frederic Blandin, Chirurgien du Roi par quartier, &c. &c. Paris, 1834. 8vo.

Des Diverses Methodes et des Differens Procédés pour L'Obliteration des Arteres dans le Traitement des Aneurismes; de leurs Avantages et de leurs Inconveniens respectifs. Par J. Lisfranc, Vice-President de l'Academie Royale de Medecine, &c. Paris, 1834. 8vo.

Illustrations on the Elementary Forms of Disease. By Robert Carswell, M. D., Professor of Pathological Anatomy in the University of London. Fasciculus fifth. Lond. 1834. Folio.

Fasciculus Sixth, Hemorrhage. London, 1834.

The Triumph of Truth and Good Sense; or, an Exposé of Quacks and Quackery. By William De Mey, M. D., &c. Newcastle-upon-Tyne, 1834. 8vo.

The Dublin Practice of Midwifery. By Henry Maunsell, M. D., Member of the R. C. Surgeons in Ireland, &c. London, 1834. 12mo, pp. 244.

The London Medical and Surgical Journal. Edited by Dr Ryan. No. 134, 135, and 136.

London Medical and Surgical Journal. From No. 124, June 14, 1834, to No. 134, Vol. vi. August 30, 1834, 136, 137. (135 not received.)

Liverpool Medical Journal, No. 4, August 1834.

Dublin Journal of Medical and Chemical Sciences, No. xvi., September 1834.

London Medical Gazette for the Session 1833-34. From No. 37, June 14, to No. 48, September 13, 1834,

Journal des Savans. Aout 1834. 4to.

ERRATUM.

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THE

EDINBURGH
MEDICAL AND SURGICAL JOURNAL.

1. JULY 1834.

PART I.

ORIGINAL COMMUNICATIONS.

Art. I.—*Case of Medullary Sarcoma, engaging the upper portion of the Os Humeri, considered Ancurismal, and for which the Subclavian Artery was tied above the Clavicle.* By John Inglis Nicol, M. D. Inverness.

On the 4th of January I was requested to meet Dr Tulloch of Fortrose, in consultation on the case of Mr T. æt. 68, a respectable Ross-shire farmer. He stated himself to have been at one period of his life a strong able-bodied man, weighing at least seventeen stones. For some years past he had been subject to stomach complaints, and had much difficulty in managing his bowels. During his present illness he had lost flesh considerably, but was still abundantly muscular to exhibit ample evidence of his former strength.

About fourteen months ago he was attacked with rheumatism in the left shoulder-joint. This pain had tormented him for about a month, when he had occasion to go to his stable loft, and had only ascended half way through the trap, when he fell, and his shoulder came in forcible contact with the edge of the hatchway. He was much stunned by the fall; and on the pain subsiding, he felt the rheumatic pain much aggravated.

During the night of the same day on which he sustained this injury he had occasion to get out of bed, and, being then somewhat confused in his ideas, he came out at the foot in place of over the side, as he had imagined. In attempting to regain his berth, he threw himself, as he fancied, into bed, but, in fact, forcibly on the floor, and thus sustained a second heavy fall, which he declared hurt him more than the former.

The shoulder-joint and contiguous parts were dreadfully pained; and though the pain gradually subsided, he was sick at stomach all the following day. He was able, however, to resume his ordinary avocations with his arm in a sling; but it was powerless all the way from the elbow to the shoulder.

The day after the accident he was examined by several surgeons, and a country bone-setter. The shoulder was a little swollen, but all of them declared that there was neither fracture nor luxation, and recommended the use of liniments. These did no good. The rheumatic pain continued, and the swelling, which had never entirely disappeared, increased. About three months ago he observed some pulsation in the tumour, which then had attained considerable magnitude. Within the last three weeks its growth was observed to be more rapid, and the pain was much aggravated.

The tumour now extends from above the acromion process to about half way down the arm. A tape passed over it in its vertical diameter measures fully 8 inches; across its transverse diameter it measures 10½ inches. It is uniform on the surface, except over the axilla, where it is more prominent. The portion contained in the axillary cavity is trifling compared with the mass which occupies the fore-part of the shoulder. A large vein, from its situation evidently the cephalic, neither varicose nor tortuous, traverses its surface; but there is no discoloration of parts.

It is elastic, yet firm to the feel; cannot be much diminished in bulk by compression; yet this applied in all directions gives but little pain. The arm admits of free motion, considering the magnitude and situation of the tumour, but this causes considerable pain. Embraced by the hand in all directions, there is a strong pulsation and distinct feeling of distension, the hand being visibly elevated, and this sensation and appearance is much stronger at its more prominent part, over and in the axilla. The humeral artery can be distinctly felt high up; but in the axilla the pulsation is suddenly lost, as if in the tumour. To the feel it is sawing and peculiar, especially close to the mass; but at the wrist it differs very little from that of the others.

The situation of the tumour, and the aspect of the large subcutaneous veins, seemed to denote the existence of malignant disease; but though accustomed, as I have been for upwards of twenty years, to see such formations in every variety, this impression was not so strong as much to weaken my confidence in expressing a different opinion. I pronounced the case to be aneurism, probably of the axillary, or, if not, of some of the humeral vessels. In this opinion Dr Tulloch freely concurred, and intimated his suspicions to this effect when he first saw him, and which was but a short time previous.

The nature of the disease was explained to our patient, the necessity of, and our rational expectations from, an operation were described; while at the same time its danger, especially at his time of life, and the frequent unhappy results at less advanced periods, were fully submitted to his consideration. Being a man of vigorous mind and much firmness, he readily assented.

Aneurism being a disease of rare occurrence in this country,* it happened that I had but one aneurismal needle in my possession, and with which (though satisfactorily used on some other, but different occasions,) I was not altogether satisfied. I consequently applied to my friend, Professor Syme of Edinburgh, to send me one better adapted to my purpose, and at the same time communicated a brief history of the case.

I deem it now due to that gentleman to state, that he then expressed considerable doubt of the tumour being aneurismal, from the situation which it principally occupied; and that if it were, the axillary artery was not implicated. He referred me to a case related by Pelletan in the second volume of his Clinical Surgery, similar in regard to the form and situation of the tumour, and which the author supposed depended on the rupture of the *thoracica humeraria;* but, added Mr S., "Are you certain that the disease does not proceed from a vascular medullary growth from the bone? Should you come to the conclusion, on another examination, that the case is not proper aneurism, but of some such nature as that just mentioned, perhaps the most prudent course would be to amputate at the joint."

A week after my first visit, and on the day which had been fixed for operation at our patient's residence, Dr Fraser of Inverness, Dr Tulloch of Fortrose, and some other professional friends being present, a second careful examination took place, when Mr Syme's views were submitted. The tumour had sensibly increased in size; there was no discoloration of parts; the superficial veins had disappeared; and, notwithstanding the justly entitled deference extended to the doubts of my esteemed friend, none were entertained by either of us as to its aneurismal character. It was now deemed advisable to delay the operation, and to remove Mr T. from his residence in Ross-shire to Inverness, with the view of affording him such attention in the after-treatment as could hardly be expected from a gentleman who had other arduous duties to perform in his extensive district, and who also resided at a considerable distance. A few days thereafter he was removed accordingly. He bore the journey well, slept better, and declared himself more free from pain than he had been for some weeks previous.

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* The only cases of aneurism which came under my notice during a period of twenty-three years, and which were the only ones I ever heard of as occurring in this part of the kingdom, were one of femoral aneurism, which was cured spontaneously,—one of popliteal cured by operation,—and two of the brachial artery consequent upon venesection. One of these occurred in August last, when I tied the axillary artery successfully. The other case was removed to the metropolis.

On the 16th, a gentle aperient was administered; on the 17th, I found him in excellent spirits, and in no way daunted by the trial to which he was about to be subjected. The tumour was not sensibly increased, although the fore-arm had become œdematous. The tongue was clean; and the pulse 84. Under a stethoscopic examination, the bellows sound was not so distinct as has been described by many writers.

Determined to take up the vessel above the clavicle, I placed our patient in a chair in a well exposed light, and in presence of Drs Macdonald, Fraser, and Mackenzie, of Inverness, Dr Tulloch, Dr Tolmie, of Campbeltown, Messrs Manford, Kennedy, Stuart, and several other professional gentlemen, proceeded to operate. The integuments were divided from the margin of the sterno-mastoid muscles transversely to near the *Trapezius.* The fibres of the *platysma myoides* and cervical *fascia* were successively divided after the manner described in other like cases.

The artery was thus reached with very little separation of parts, and at a depth corresponding with the extent of the opening without. A small perforation was made in the *theca*, and I then attempted to pass a needle both from before and behind under the artery, but the parts were so narrowed as to render it totally inapplicable. I next tried a slender silver needle having a long straight stem, with a slight curve at its point; this I readily passed behind and under it, dipping my left fore-finger below the vessel anteriorly, and holding the needle firmly with the right hand, I caught its point on my nail, and with facility carried it upwards, so as easily to reach the ligature, and without displacing the artery in the least from its connections. It was then gently but sufficiently elevated by the instrument to impede the transmission of blood, and the tumour being now successively felt by several of the gentlemen present, was declared to have no pulsation.

As it might be possible that some nervous twigs were included by the needle, from the manner in which it was found necessary to use it while the vessel was thus elevated, I passed a second armed needle from before backwards, close to the former, and with such care as to remove every doubt on this point. In confirmation, after the first needle was withdrawn, pressure was made on the vessel over the second, and not the slightest pain was produced. The ligature, consisting of a single thread of three-ply silk, was now tied, and the separated parts were brought together by two sutures.

The vessel was tied a few lines from the edge of the *scalenus*, which was not exposed. The hard texture of the plexus and the pulsation of the vessel were sufficient guides in progress; and although the separation of parts was perhaps smaller than usual, every thing divided was rendered successively and satisfactorily visible by means of a bent copper spatula. The external jugular vein was avoided. The larger and deeper vessels were not brought into view, nor were any in the least calculated to give annoyance divided throughout.

The operation lasted thirty-five minutes, and not two tea-spoonfulls of blood were lost.

When compared with what he had often suffered throughout the progress of the disease, Mr T. marvelled at the little pain experienced from the operation. The only annoyance he had, though not discovered at the time, was when the *plexus* was fingered. The sensations then sent down the arm, he described as being peculiarly unpleasant.

For some time after he had been put to bed the arm continued cold, but the application of hot flannels soon restored it to the temperature of his body; and three hours thereafter, I had the satisfaction to observe the subcutaneous veins on the back of the hand and some way up the arm well distended. The tumour was free from pain and more flaccid, but not much diminished in bulk. To the feel it was somewhat lobular.

9 P. M.—He expressed himself much more easy since the operation. Pulse 92.

Apply saturnine lotion to the tumour, and let him have *Liq. Mur. Morphii* ʒss. in *Aq. Font.* ℥ss.

18th. 11 A. M.—In the earlier part of the night he was troubled with a cough, which caused considerable pain in the wound. This was diminished soon after he got the opiate, and he then slept soundly. Pulse 81. Had some tea and stale bread for breakfast.

11 P. M.—Passed the day comfortably; had some sleep; feels now rather heated; pulse 92. The tumour is more flaccid, but not much diminished. Says it has been more pained, the pain extending down the arm; but this, he is satisfied, was caused by the uneasy position in which he lay in bed. Thinks he will sleep to-night without an opiate.

19th. Slept indifferently. About eight o'clock A. M. he felt uneasy, having awoke from sleep with starting and confusion. It was now ascertained that some *kind friend* had given him an opium lozenge to allay the cough. Pulse 78. Had an enema. Bowels moved; and feels much easier.

20th. 7 P. M.—On my return at the time, after an unavoidable absence of thirty-six hours, I found him going on well and under the influence of a purgative. Contrary to order he had been several times out of bed to stool, and it was with some difficulty that he was impressed with a due sense of danger from any exertion. Feels easy; the tumour is evidently diminishing in bulk; says he felt during the afternoon considerable pain in the elbow, fore-arm, and wrist, but this wore gradually away by gentle friction; pulse 96. Thinks he will be better without the opiate.

21st. 10 A. M.—Slept indifferently; awoke confused; feels somewhat duller; pulse 90, and slightly intermitting. The wound is dressed, and seems agglutinated by the first intention; is firm and healthy, with a slight purulent oozing from beside the ligature.

10 P. M.—Felt very uncomfortable during the afternoon and evening. The cough distressed him and hurt the wound; had the following draught.

℞ *Liq. Mur. Morphiæ*, *Vin. Sem. Colch.* aa. ʒss. *Aq. Font.* ℥i. *M.*

22d. 10 A. M.—Was very restless after taking the draught until twelve o'clock, when he became more tranquil, got some broken sleep, and moaned considerably. About 3 A. M. his sleep was heavy and lethargic, and towards day light his face became flushed. He now breathed with a strong rattle, yet without stertor; could be roused only with difficulty, but then spoke coherently, and was free from pain.* The face is still flushed; pulse 112, soft and regular. In attempting to swallow his drink, each effort at deglutition causes him to cough and expectorate a considerable portion of viscid phlegm. After several such efforts, the rattle disappeared, and he breathed freely.

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* Some of my friends who accompanied me on the present visit seemed to think he was dying; and I must confess that such was my own impression.

ʒvi. of blood were taken from the arm, and on observing that it was cupped, ℥xij. more were immediately withdrawn. This was not sizy. The pulse now fell to 100.

10 P. M.—He passed the day in the same state of lethargic stupor, the cause of which it was difficult to determine. At one period I was impressed with the idea, that some more opium lozenges had been given him; and that these, together with his draught, had placed him under narcotic influence. Under this impression coffee was administered, and a stream of cold water was several times directed over his face and hands, and the volatile alkali was also freely used; but neither seemed to rouse him in the least save for a few seconds, when, after uttering a sentence or two, (perfectly coherent,) he sunk into the same state. At this time I was relieved from a state of perplexing anxiety by a visit from his son, who assured me that the state of stupor was no unusual occurrence; that on several former occasions he had seen him for a day together in the same state, and that once for two whole days he was quite unconscious of what was passing around him;—that he was satisfied it was in no way implicated with the operation, but was the consequence of exposure to cold while at stool, and it gave him no uneasiness. This was corroborated by Dr Fraser, who had attended him on one of those occasions. An enema consisting of *Infus. Sennæ* lb. *ij. Ol. Crot. Tig.* m. x. *in Eau de Cologne* ʒi. was now exhibited, and at the same time an aloetic pill with gr. ¼. *Ex. Elaterii* was administered.

11 P. M.—Was more awake than he had been at any time throughout the day; spoke distinctly for a few minutes, and shortly after took a drink.

12 P. M.—Was now awake; said he had no pain, but felt extremely weak. Tongue foul along the median furrow; pulse 108, regular; soon fell asleep.

23d. 10 A. M.—The bowels were moved. His son's opinion is now fully confirmed. The stupor is gone—he speaks freely and readily—complains of pain in his throat, also of the arm and shoulder on the least motion; has no pain in either when the limb is in a quiescent state. Says he passed the night tolerably well, and the wound gives him no uneasiness. Urine scanty and high-coloured; pulse 104, full. Repeat the enema and laxative pill.

8 P. M.—The bowels have been freely moved; says he is more comfortable. He facetiously adverted to his stupor of yesterday by characterising it as an old acquaintance, "*the trim of which he knew fine*," and was quite unconnected with the operation. Pulse 100, soft and regular; looks better. Repeat the laxative pill at 10 o'clock, and continue the low diet.

12 P. M.—Continues easy; pulse 98; has made urine frequently since last report, and not so high in colour. Wound seems united; little or no moisture on the dressings. Bowels have been freely moved. Ordered *Sol. Antim. Tart. c. Liq. Morphii* every four hours to such extent as the stomach can bear without actual nausea.

24th. 10 A. M.—Passed a restless night; coughed hard; says he feels uncomfortable, but has no pain; pulse 100, and intermitting; tongue dry and foul; resists the gruel drink. Weak beef-tea ordered, and the enema to be repeated.

2 P. M.—Feels much better; his appearance is improved; pulse 98, soft, and less intermitting; tongue cleaner and more moist.

11 P. M.—Passed the afternoon comfortably; complains much of his stinted diet, and petitions earnestly to have a bit of meat; says he is sure it will do him good. Had some broth, and a small allowance of table beer, with which he seemed much satisfied and refreshed. Cough still troublesome; pulse 84; soft, and intermits only once in the minute. Continue the antimonial, and repeat the purgative pill.

25th. 10 A. M.—Had an indifferent night; complains much of his tongue and throat; pulse 80, and more intermitting than yesterday.

8 P. M.—Slept several hours together during the day; cough still troublesome; pulse 88, intermitting; wound is suppurating; the stitches are removed, and the edges separate.

26th. 10 A. M.—Had a good night, but complains much of his tongue and throat. The former is nevertheless much cleaner. Repeat the purgative pill.

27th. 10 A. M.—Slept well, but the pain in the tongue and throat is much aggravated; the whole aphthous, and much inflamed; has much difficulty in speaking and swallowing; pulse 84. The enema had been repeated, and the bowels twice freely moved.

11 P. M.—Is desponding. The inflamed and aphthous state of the mouth and fauces, and consequently the difficulty of speaking and swallowing much increased; much viscid mucus and saliva is discharged; pulse 92, regular; the outer edges of the wound are inflamed, and suppuration is fully established. Turnip poultice applied. Venesection *ad* ℥viij. Blood not sizy. Antimonial continued, and two small vesicatories applied below the angles of the jaw.

28th. 10 A. M.—Slept well, and is much relieved; swallows more easily, and speaks more readily; tongue and mouth less aphthous and inflamed; the viscid muco-salivary discharge still copious; pulse 88, soft and regular.

8 P. M.—Continues improving; the wound more open, and looks sloughy; the tumour continues diminishing. Repeat the purgative, and let the tumour and arm be embrocated morning and evening with *Liniment. Saponis c. Ol. Cayaputæ.*

29th. 8 P. M.—Passed the night and day comfortably; throat much less inflamed, and tongue nearly clean; pulse 88, regular. Has occasional short fits of hiccup, but is in excellent spirits. Wound looks cleaner, and discharges healthy matter.

30th. Is in every respect better; his general appearance much improved; pulse 88; tongue clean; aphthous and inflamed state of the throat entirely gone. The wound is clean and granulating, but the pale appearance of its whole surface seems highly characteristic of some defective action in his general system. Repeat the purgative.

31st. Much as yesterday; is in good spirits; wound looks rather more healthy; pulse varies from 88 to 94. Had some chicken soup and chicken for dinner, and sat up for an hour on the sofa. Continue the antimonial.

Feb. 1st. In all respects is much improved; the tumour is much diminished; the wound is contracting; the process of reparation, however, seems much more rapid at the surface than at the bottom; the discharge is scanty; and the granulations are too pale in their aspect to be considered healthy.

Feb. 7th. From the period of last report up till the present, his progress was so satisfactory, as to render any further particular details unnecessary. On the morning of this day, I found him preparing to come out of bed; his appearance was fully as good as before the operation. He expressed himself "light as a linnet;" said he had no annoyance of any kind, save from his arm and shoulder, which pained him much on the slightest motion. The tongue was clean; the pulse 88, soft and regular; and the wound had contracted considerably, notwithstanding the languid character of the granulations. The tumour had sensibly diminished; there was no discoloration, and there was no dread of its suppuration. He was altogether so well as to disarm me of every apprehension as to the issue; and I even went the length of assuring him, that if he continued to make progress as he had done for a few days longer, I would attempt the removal of the ligature, and permit him to return home. The operation had been performed this day three weeks.

At half-past seven P. M. I received a hurried message in the street, and near to his residence. I instantly repaired to his bedside, and found him deluged with blood. One of the women about him was endeavouring to stem the torrent by the application of a towel to the wound. This was effectually accomplished by the point of my fore-finger, moderately pressed into it, and which was now so much contracted as to be thereby completely plugged up. At this time the bowels were largely moved; no purgative had been exhibited for some considerable time previous.

After the lapse of a few minutes, he revived from the state of syncope, into which he had fallen; and the pulsation at the wrist became much stronger than I had cause to expect, considering the appearance of the bloody cloths.

Upon inquiry, I learned that he had sat up during the day for about three hours; that he had made considerable exertion in getting into bed; that he continued thereafter for some hours in his usual state; about five o'clock he fell into a tranquil sleep, at a quarter past seven he awoke, and observed to Mrs T. that he felt something trickle down his side. Upon examination, she observed the bleeding, and immediately ran to the landlady for assistance. She was prompt in the application of a towel, but unfortunately directed the pressure against the clavicle, and thus a much greater quantity of blood was lost. It was copiously flowing from under the towel on my arrival, and, so far as I could hazard an opinion, from one and a-half to two pounds must have been lost.

At the moment neither the colour of the blood, nor the account of the manner in which it flowed, could guide me to a satisfactory conclusion as to its real character; yet there seemed to be ample evidence to establish this point. To place the matter, however, beyond doubt, I withdrew my finger, but there was not the slightest oozing from any part of the wound, which was clean, and presenting its usual appearance. ʒss. *Liq. Mur. Morphiæ* was administered. The part was covered with dry lint, and moderate pressure with a dry sponge directed by the hand was unremittingly continued by my apprentices in succession for forty-eight hours, and thereafter by the attendants, as I had abundant cause to dread a recurrence. Before leaving him at this time, the pulse had so much recovered its fulness as to lead some of my professional friends to remark that I had considerably overrated the quantity of blood lost.

12 Midnight.—Had some sleep; is quite collected, but much dismayed by the occurrence of the hemorrhage; pulse 108.

2 A. M.—Slept at intervals; feels weak; pressure on the wound very slight; no oozing; had the bloody clothes and sheets removed, and expressed himself much more comfortable. Complains of his back. On examination the parts above the sacrum were discovered to be inflamed and partly excoriated. These were covered with lint spread over with the precipitate formed by *Sol. Acet. Plumb. in Infus. Gall.*—a preparation which I

have for many years used with advantage under similar circumstances.

4 A. M.—Was very restless for the last two hours, great thirst; complains of much pain in the left fore-arm; no oozing from the wound.

6 A. M.—Had intervals of sleep; pain in the arm undiminished.

8th. Passed the day astonishingly well; pulse 96, regular, and its fulness very remarkable. During the day he took some nourishment, and in the afternoon he had three copious evacuations of the bowels without medicine. In the evening the wound was examined, when the ligature, hitherto untouched, came away with the dressings, and unaccompanied with any slough. There was no oozing, nor any untoward appearance, except a more pale aspect and diminished purulent secretion. Ordered thin gruel with milk, slightly sweetened, for common drink, and the anodyne to be repeated.

9th. 10 A. M.—Had some sleep during the night; pulse 96, and weaker. Ordered cretaceous mixture.

3 P. M.—At this time he was shifted in bed, and shortly after had a severe rigor. Fever supervened, and he became much saddened and sunken.

8th. Diarrhœa continues; pulse 119, and regular. Increase the quantity of cretaceous mixture, *c. Liq. Ammon Acet. et Mur. Morphiæ*, and let him have a starch enema, with m. xl. of the same anodyne.

10th. 10 A. M.—Passed the night well; slept soundly; seems much improved and refreshed; speaks with his wonted cheerfulness, and craves something nice for dinner. Had an egg and tea for breakfast; pulse 108, fuller, more soft and regular; tongue clean; bowels have not been moved since he had the enema.

6 P. M.—Diarrhœa has returned. In the afternoon he became more febrile; he is now labouring under a severe rigor; pulse tremulous, quick, feeble, and scarcely distinguishable. The rigor lasted about three quarters of an hour, and soon after this wore off, he fell into a state of stupor, and became hourly weaker, until half-past three of the following day, when he died; being the 25th day after the operation.

Post Mortem Examination after a lapse of twenty-two hours.—On removing the body, the left arm hung loosely, and it was now for the first time discovered, that the *humerus* was detached about three inches from its head. This was supposed to have arisen from partial absorption.

The outer and inner extremities of the interior of the wound are darkened or sloughy in colour; but upon minute examination this seems more caused by the putrefactive process, which appeared to have now commenced, than by previous destruction, On separating the clavicle from its attachments and articulations. ulceration of the periosteum of this bone, about the size of a shilling, was discovered, apparently not of long standing, close to its sternal articulation, where it closely adjoins the first rib, and which seemed also to have been implicated in the ulcerative process.

The proximal extremity of the artery projected about a quarter of an inch beyond the margin of the *scalenus*. Its mouth was open, but plugged with a *coagulum* firmly adherent to the sides, yet the thickness of its coats were as distinguishable as if its section had been recent. The portion projecting beyond the *scalenus* was of a leaden colour, but the texture was firm. The contiguous cellular substance, a short way around it, and extending to the surface of the wound, partook of the same colour. On removing and slitting up the vessel, it was found that the *coagulum* was membranous, firmly adherent to the sides, save at its upper part, where there seemed to be separation and subsequent reparation,—a circumstance which will account for the source of the hemorrhage. To the *coagulum* was attached a long blanched film, indicative of its former length, or the extent to which it had penetrated into the vessel. The distal extremity of the vessel was retracted from the former more than half an inch. It was open as if recently divided, and the thickness of its coats was well defined. Together with the cellular substance, it was similarly discoloured as the upper portion, and to like extent. A short way within its mouth, a blanched membranous film nearly, but not wholly, obliterating the vessel, was observed adherent to its sides, and extending loosely downwards to double the length of the former. The intervening surface of the wound, and all the other parts, were unaltered.

The artery was now traced downwards into the axilla, and *was found perfectly sound alongside and past the tumour*, to which, with the accompanying vessels and nerves, it was firmly adherent.

On removing the muscles, which were also firmly adherent, the tumour was found to be saccular or encysted. It was much diminished in size, and the axillary projection formerly described was now found to be caused by its being strapped down by the long head of the *biceps*. When it was freely exposed, and divided by a section, it presented all the characters of medullary *sarcoma*, —a conglomerate mass of medullary matter irregularly intersected with ligamento-cartilaginous bands, and having intermediate cavities throughout of a dirty-brown colour, which seemed to have been recently emptied of blood.

Not a particle of matter, I mean purulent secretion, was found; and whether these empty spaces were caused by handling the mass while its more tender structure was so friable as nearly to approach solution, or whether they were pre-occupied by blood, and now emptied as the other vessels were after death, I shall not pretend to hazard an opinion. The bone, in its whole diameter for three inches downwards, had entirely disappeared. A very few spicula were felt by the knife in making the section; these, however, were not visible to the eye, and a thin shell of the head, corresponding with its articulating surface, only remained. On disarticulation, its surface was sound, as was also the scapular cavity, although the ligamentous structures were much thickened. A further examination of the body was not permitted.

Remarks.—Unfortunate as the result of this case has been, in a professional point of view it is not devoid of interest, as it in no way militates against the expediency, or even safety, of the operation when performed under more favourable circumstances. For there was every reason to believe that, notwithstanding the languid progress of reparation throughout, and under a depraved system, complete cicatrization would have been accomplished, but for the partial separation of the coagulum, and consequent loss of blood,—an occurrence which must have resulted entirely from the patient's own imprudence, in exerting himself as he did to get into bed on the day on which it happened. He was cautioned at the time, but was determined to try his strength, and would not be controlled. Whether the coats of the vessel had originally adhered, and afterwards became separated, must be mere matter of conjecture; but the reunion of the separated portion of the coagulum, aided by pressure, was sufficient to prevent a recurrence of the hemorrhage.

It is also matter of difficulty to determine how long after the operation the bone had been absorbed, so as completely to have destroyed its continuity. All along he was extremely averse to have his arm moved. He nursed it carefully; and the outward appearance and progress of diminution in the size of the tumour being so satisfactory it was seldom examined. Certain it is, however, that up till the moment of examination after death, there was no suspicion entertained of the bone being the seat of the disease, far less of its extensive destruction. Even after the main artery had been traced entire beyond the tumour, and the lower detached end of the bone had then become distinctly felt through the soft parts, the belief of the existence of aneurism was still entertained. The fracture or absorption being referred to aneurismal pressure, a section of the malignant disease alone dissipated this impression.

Fortunately, such cases as the preceding are of rare occurrence. Yet they have occurred, and have been noticed by Mr Samuel Cooper, to whom the profession can never be too grateful.* His remarks are so much in point, that I shall offer no apology for now transcribing them.

"An extraordinary disease, having very much the appearance of an aneurism, sometimes presents itself. A swelling, attended with considerable pain and a strong pulsation, is gradually produced high up the arm, and at length attains a very large size. The strength of the throbbings leads to the suspicion that the case must be an aneurism, but on careful examination, the humerus is found to have given way at a point involved in the disease, and hence to be flexible, as if there were a fracture.

"This circumstance, and the extension of the swelling too far away from the tract of the artery, in time raise doubts about the case being aneurism. The patient ultimately falls a victim to the effects of the disease on the constitution; and when the arm is dissected after death, the tumour is found to consist of a sarcomatous or medullary mass, occupying the central portion of the limb, and accompanied with a solution of continuity extending completely through the whole thickness of the bone." Mr C. states, that two cases of this description were admitted into St Bartholomew's Hospital in the course of the year 1820, and that Mr Vincent had seen a similar disease in the leg.† In the present case, the bone had not given way prior to the operation, nor could solution of continuity then be discovered by the most careful examination. The principal bulk of the tumour was unquestionably remote from the tract of the artery, but a very considerable portion of it projected into, and over the axilla, leading to the belief that the vessel terminated fairly into it, about the distance of one-third part from its mesial margin.

The examples of imposthumations and other tumours having the pulsatory character of aneurism are numerous. I have myself seen an enlarged thyroid gland possess this in an eminent degree, and also an abscess situated in the bend of the arm.

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* See 4th edition, p. 119. Surgical Dictionary.

† A case of diseased humerus, in which the tumour much resembled that of Mr T.'s in shape and situation, occurred to Mr Baldy of Plymouth. There was, however, no pulsation, nor was the bone absorbed. Though diseased to like extent, and surrounded by "one solid mass of diseased organized substance," amputation at the joint was performed, and the patient recovered.—See Vol. xl. page 363, Lond. Med. Journal.

When such cases do occur they are said to be distinguished from real aneurism. 1*st*, By drawing the tumour aside, when the pulsation ceases. 2*d*, By the alternate rise and fall of the swelling, and which merely amounts to a real change of situation. 3*d*, By the absence of the sawing or thrilling character of the pulsation, and the bellows sound in the tumour. 4*th*, By remarking how far they deviate in their locality from the regular course of the artery; and 5*th*, by their peculiarity to the feel and their outward appearance.

In the present case, to draw the diseased mass aside was impossible, as it completely invested the circumference of the bone, and which was continuous—neither could its rise and fall be attributed to changes of situation for the same reason. The pulsatory impetus of the principal artery to such an elastic mass must have been powerfully increased by the synchronous pulsations of the vessels of the mass itself, and which were of considerable magnitude, as well as through the consequent undulations of the venous contents, and which *in cumulo* would occupy a large portion of its whole bulk. To this fact, together with that of its being medullary in structure and cysted within, I attribute the sensation of pulsatory distension, and which was peculiarly strong in every direction, though more so in some parts than in others. The whole hand when pressed over it was just as strongly moved as in any case of aneurism I had ever seen. The thrilling or sawing sensation was not less so; but the bellows sound, though believed and admitted to exist, was by no means very distinct.

The situation of the tumour was the most staggering anomaly of the whole case, but even this did not amount to such an extent as to preclude the belief that the axillary artery was implicated. It was no doubt felt pulsating high up in the axilla, but then it seemed to be suddenly lost in the mass. If this really was not the case, the other distinguishing characters of the disease were so strong that in such an event the formation could, in our estimation, only be referred to false aneurism of one of the smaller arteries consequent on injury sustained in the patient's fall through the hatchway. To the feel the mass was elastic, and was considered to be the formation of what is usually designated *coagulum*, but the sensation of profound fluctuation was indistinct or entirely wanting.

Had there been discoloration of surface or an extensive investment with large and tortuous veins, I would have at once inferred the existence of malignant disease; but the mass being encysted, precluded the presence of either. The disappearance of the vein after my first visit is somewhat curious, nor am I able to refer this circumstance to any probable cause, as there was evidently none, save a sensible increase in the size of the tumour. In most cases of malignant disease, however, especially those of true *osteo-sarcoma* and *fungus hæmatodes*, the enlargement of the superficial veins is regularly progressive with the increase of the mass. At least this is conformable to my experience. But, with every deference, I would submit, that, in this respect, as regards the outward aspect of large aneurismal formations, too little attention has hitherto been given by the numerous writers on the subject; as it is not improbable, that in this respect they may present some peculiarities which might lead to a more perfect distinction from those formations for which they are sometimes mistaken. Should it be found through the evidence of accumulated facts, that in most large aneurismal tumours they are not pervaded by numerous large and tortuous veins, then those cases in which they do exist, though possessing the pulsatory character, might with greater accuracy be referred to their proper cause, or, at all events, might narrow the existing doubt to the extent of a possibility that, if the disease was malignant, as in the present case, the mass must be encysted.

In connection with these remarks, however, I may observe, that some cases may occur where the most experienced surgeons, and those whose opportunities of witnessing morbid structures in every possible variety could not be exceeded, may sometimes be deceived. In illustration, I cannot resist narrating the following case, which occurred to M. Pelletan, * and was kindly transmitted to me by Mr Syme.

"F. Leclerc, æt. 36, was admitted into the Hotel-Dieu, 14th April 1815. He had an immense tumour occupying all the length and circumference of the arm from below the clavicle till within four fingers' breadth of the articulation of the elbow. On the 26th September 1813, he fell from a tree but broke his fall by seizing a branch, to which he remained suspended by the right arm for some time. He was thus enabled to descend, but the pain of the right shoulder was very great. He applied to the quack of the village, who tortured it much by moving the arm in every direction, and the shoulder became much tumefied. By topical applications this was so much reduced that he resumed his labour.

"In January 1814, he became a soldier, but was obliged to quit the service in five days, in consequence of the weakness of his arm. Soon after, by violent exertion, he lost the use of it, and it hung by his side powerless, the same as on the day of the accident. The same quack was consulted, and he experienced like torture as before; he soon resumed light labour, but the pain progressing he put his arm in a sling till 15th May following. He now resumed his wonted occupation; this he continued with much uneasiness until 15th of July, when the pain became insupportable, and a tumour appeared on the shoulder, having a pulsatory movement.

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* Observation sur un Osteo-Sarcôme de L'Humérus simulant un anéurisme. Par Ph. J. Pelletan. Paris, 1815.

The tumour increased till the 20th of October, when it was submitted to M. Dupuytren at the Hotel-Dieu. He pronounced the case to be aneurism, and proposed amputation of the arm. This was resisted, and a veterinary surgeon, under whose care he placed himself, cauterized the tumour in three different places. Two of them soon healed. On the 3d of February a considerable hemorrhage supervened from the third. The tumour was undiminished. On the 26th and 28th March the hemorrhage recurred, the blood flowing by continuous jets. On the 29th it issued in three separate currents; he was much weakened by the loss of blood, and conveyed to the Hotel-Dieu on the 14th of April, as already stated, and came under the care of M. Pelletan, who suspected the case to be aneurism.

On minute examination, the tumour was found to be uniform on its surface; full of varicose veins. The pulsation of the humeral artery was distinctly felt in its course. There was no pulsation in the mass save here alone. It was elastic to the feel and appeared to have profound fluctuation to small extent. In endeavouring to overcome the stiffness of the arm, it was found that the bone was broken about four inches from the elbow-joint. He now pronounced the case to be *osteo-sarcoma*; ten or twelve further examinations confirmed him in this opinion; palliative remedies were resorted to, and the patient's death was early anticipated.

On the 1st of May an extraordinary change took place; a confused noise was heard below the clavicle in the course of the artery. On the 3d this peculiar sound was discernible in the axilla. Many professional men had visited the patient, and a very general opinion prevailed of the disease being aneurism. M. Pelletan was staggered in his former opinion, and now considered it to be that species of aneurism which he called Pott's aneurism, where the tumour has no pulsation, and is very slow in developing itself. It is hollow, and destroys the substance of the bone. It is never formed by an arterial trunk, but by the alteration of a branch of the 3d or 4th order. Under this impression he proceeded to operate.

The artery being compressed by an assistant *under the clavicle*, he introduced a knife between the pectoral muscle, and separated this muscle from its attachment to the humerus, carrying his section as high up as the clavicle; in doing so he divided eight large arteries, which he secured; he then tied the axillary trunk, and made a large incision into the tumour, when he found it to be an *osteo-sarcoma*, part of which only was removed, and the patient died two hours thereafter. The whole osseous structure invested by the tumour had disappeared, with the exception of a thin shell of the articulating surface. I annex a graphic representation of the appearances as given with the case.

M. Pelletan does not say whether the diseased mass was encysted; but there is some reason to doubt that this was really the case,—at least the presence of the numerous varicose veins would lead me to infer differently.

In the case of Mr T., had amputation at the shoulder-joint been done in the first instance, his existence might have been prolonged; but the history of the case, taken as a whole, the appearance of the tumour, the absence of discoloration, its strong pulsation and uniform distension, its comparative insensibility, and the disappearance of the superficial vein visible only when I first saw him, were irresistible.

Mr T. was a man highly and deservedly esteemed in the country by all who knew him; and his case excited intense public interest. To the profession in particular I would express my grateful acknowledgments for their solicitude for his recovery, and to Drs Macdonald and Fraser, my best thanks are due for their unremitting attention, and the promptness with which they rendered their occasional assistance.

Explanation of the Plates.

Fig. 1. The appearance of the tumour prior to the operation.
Fig. 2. Appearance of the tumour after death.
Fig. 3. The upper portion of the artery slit open.
  1. The coagulum become membranous and firmly adherent to
  2. The coats.
  3. The second day coagulum supposed to have succeeded the hemorrhage.
  4. A flocculent film of unabsorbed fibrine atttached to the plug, and marking the length of the original coagulum.
Fig. 4. The lower portion of the artery.
  1. The superior aperture with the coats separated.
  2. Flocculent film of fibrine attached as in Fig. 3.
Fig. 5. The full size of the needle used with double the curvature.
Fig. 6. The tumour cut open.

Fig. 1.

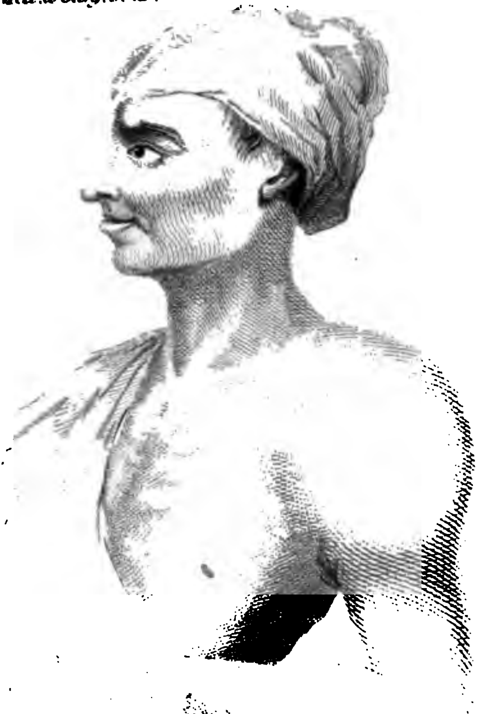


Fig. 4.

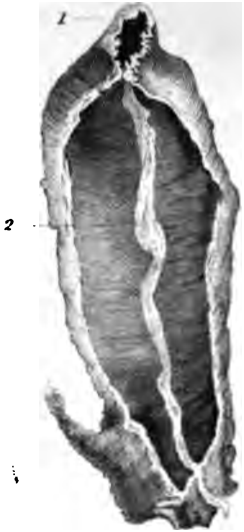


Fig. 3.

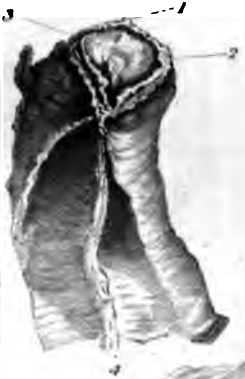


Fig. 2.

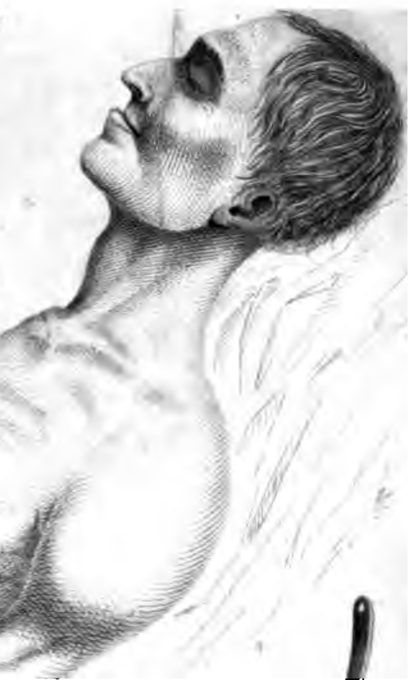


Fig. 5.

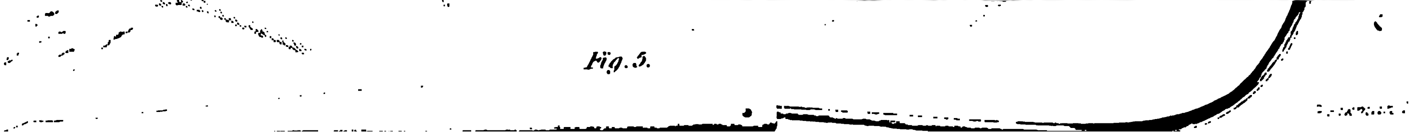


Fig. 6.

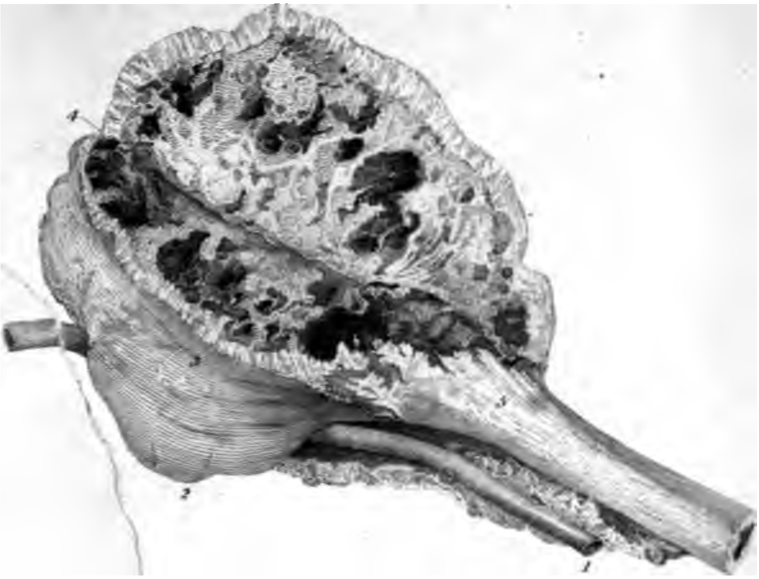
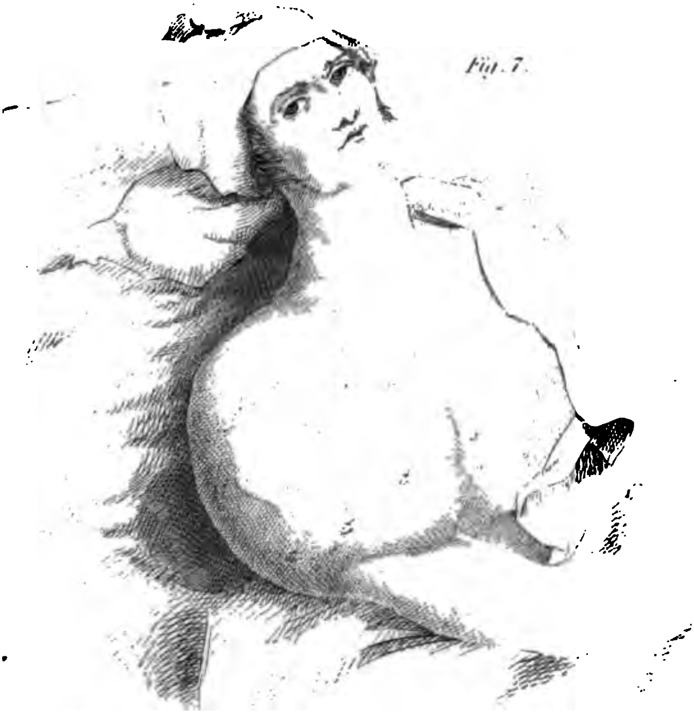


Fig. 7.



G. Holman Sc.

1. The axillary artery passing under.
2. The promontory projecting into and over the cavity.
3. Sulcus formed by the long head of the biceps.
4. Part immediately over the remaining shell of the head of the humerus.
5. The lower portion of the bone, which at this part had no spongy character, and seemed as if fractured, being perfectly sharp at the edges.

Fig. 7. Appearances in M. Pelletan's case.

Murray Place, 16*th February* 1834.

Art. II.—*Observations, Pathological and Therapeutic, on a particular species of Quinsy or Angina, depending on Diffuse Inflammation of the Base of the Tongue, and its connections with the Inferior Jaw, Palate, and Pharynx.* By David Craigie, M. D., F. R. S. E., Fellow of the Royal College of Physicians, Physician to the Royal Infirmary, and Lecturer on Clinical Medicine and the Practice of Physic.

The disease denominated Quinsy or Sore Throat is peculiar in this circumstance, that it is sometimes so trifling as to require no medical assistance or peculiar attention, and in other cases it is so severe as to produce sudden and unexpected death. From a considerable number of examples of the disease which I have seen, I infer that this peculiarity depends on the fact, that it assumes two, if not three, different forms; one a superficial, confined chiefly to the mucous membrane of the tonsils, palate, *uvula*, and *pharynx*; the other a deep-seated, affecting not only the mucous membrane, but the substance of the tonsillar lobules, their submucous cellular tissue, and that of the palate and *uvula*; and the third affecting, with the parts now specified, the base of the tongue, and spreading by this not only laterally to the *rami* of the inferior jaw, but interiorly to the *epiglottis*, and occasionally to the *glottis* itself.

In the former case the disease produces little inconvenience, and presents the usual characters common to sore throat, that is to say, a sense of soreness and tenderness of the mucous membrane of the palate, tonsils, and *pharynx*, with difficulty and pain of deglutition; and when the throat is inspected, which is done with comparative facility, the membrane is found red and diffusely swelled.

In the latter case, however, when the submucous filamentous tissue is affected, a much more formidable train of symptoms is observed. Not only is the patient totally unable to depress the jaw sufficiently to allow the throat to be inspected fully, but the tongue cannot be moved, deglutition is completely impracticable, and even thin fluids cannot be swallowed. When the attempt to swallow is made, they produce great pain, and are rejected through the nostrils. At the same time respiration, and especially expiration, is performed so completely by the nostrils, that the air is expelled from them with a forcible blowing noise. In this state, also, the patient, instead of speaking as in health through the throat, snivels or utters his speech in an inarticulate and painful manner by the nostrils, or, to speak more accurately, without the motion of the soft palate and *uvula.* With these symptoms there is generally conjoined a profuse secretion of *saliva* and ropy *mucus*, which, instead of being swallowed or coughed up, trickles incessantly from the mouth, so that the patient appears as if in a state of profuse salivation.

The symptoms now enumerated depend upon inflammation affecting not only the substance of the tonsils and the mucous membrane of the throat, but the whole submucous tissue of the *velum palatinum*, *uvula*, and pillars of the *fauces*, the substance of the tongue, especially towards its basis, and spreading thence on each side to the filamentous tissue under the angle of the jaw, and even to that communicating with the neck.

When the tonsillar and palatine mucous membrane alone is affected, the disease may be recognized by redness and diffuse swelling of these parts. The constituent glands of the tonsils are sometimes chiefly or alone affected; and then these bodies become so much enlarged as to project from the space between the anterior and posterior pillars of the *fauces* in the form of two globular or spheroidal bodies on each side, pressing on the *uvula*, diminishing or obliterating the passage between the *uvula* and the lateral pillars, and giving rise to considerable difficulty of deglutition, and pain more or less constant, but much aggravated when deglutition is attempted. In this form of the complaint, however, as the base of the tongue is not very much swelled, the jaw may yet be depressed, deglutition is still practicable, and the patient swallows fluids, and even soft solids occasionally.

In the third form of the disorder, that, namely, in which the submucous cellular tissue is the seat of disease, not only are the tonsils considerably swelled, but the whole submucous and muscular tissue of the tongue and the submucous tissue of the lower jaw and lateral parts of the throat are diffusely enlarged, hard, and painful, so as to render it absolutely impossible to depress the jaw in order to inspect the throat;

while the swelling of the base of the tongue prevents the patient from moving that organ backward or in any direction, and, consequently, from swallowing or speaking articulately. The *velum* especially is so much thickened, that it loses flexibility and pliancy, and can no longer in the motions of deglutition be reflected upwards to cover the posterior nasal cavities. As the disease proceeds, these parts become still more generally swelled, and so unfit to obey the action of the muscles of deglutition, that not only is the patient unable to swallow solids, but he cannot even get fluids to pass into the *œsophagus*; and when the attempt is made, they regurgitate by the nostrils. The irritation of the nasal mucous membrane, thus induced by the application of substances to which it is not habituated, gives rise to swelling of that membrane, and so far changes the voice, that the patient snivels and speaks inarticulately through the nose; or, in other words, is unable to speak by the throat, mouth, teeth, and lips. At the same time respiration is performed entirely through the nose with such force, that in expiration each breath is forcibly expelled from the nostrils in a current sufficient to affect the flame of a candle or taper. An incessant and copious stream of saliva issuing from the open mouth, attending this variety of inflammation of the throat, proceeds partly from the morbidly increased secretion of the salivary glands and tonsils, and partly from the circumstance of the impracticability of swallowing the saliva as it is secreted, as in health.

To understand more clearly and fully, however, the effect of this disease in producing death, it is requisite to attend for a little to the mechanism of deglutition, and its influence in deranging that function.

During the act of swallowing, the base of the tongue is carried backwards, the *epiglottis* is depressed and placed over the upper aperture of the *larynx*, so as to prevent articles of food or drink from dropping into the *glottis*, the *larynx* is drawn upwards and forwards, the soft palate and *uvula* are drawn upwards and applied behind the posterior opening of the nasal cavities, and the mass to be swallowed being deposited in the upper part of the *pharynx*, that part is contracted by the successive action of its muscular apparatus, and the alimentary mass is conveyed into the *œsophagus*.

In the disease of which I now speak, either the whole of the actions now specified are very much interrupted and impaired, or they are so completely impeded that deglutition is utterly impracticable. The body and base of the tongue, already much swelled, cannot be carried backwards; the *epiglottis* is incapable of being depressed, and inflected over the superior laryngeal aperture; the soft palate and *uvula* cannot be reflected upwards to cover the posterior aperture of the nasal cavities; the *larynx* cannot be elevated and drawn forwards; nor can the superior division of the *pharynx* be contracted by its muscular apparatus.

The result of this is, that both the secreted fluids of the throat and mouth, and any articles of drink, are either allowed to run over the throat without being conveyed by the tongue and *pharynx*, and, consequently, with the incessant effect of trickling over the *glottis*, and irritating its mucous membrane, or they are rejected by the mouth, or regurgitated through the nostrils, in consequence of the soft palate being no longer folded up like a protecting curtain to close their posterior opening, and prevent the introduction of articles of food and drink. At the same time, in consequence of the immobility of the tongue generally, articulate speech is completely interrupted, and the patient utters at first inarticulate sounds, and then speaks through the nose.

In consequence of this interruption of the functions of the tongue and *epiglottis* on the one hand, and those of the soft palate, *uvula*, and pharyngeal muscles on the other, a secondary inflammation is induced in two parts, namely, the nasal mucous membrane and the *glottis*, which give a peculiarly complex and aggravated character to the disease. The inflammation of the nasal mucous membrane is simply painful to feel, and distressing to behold, in consequence of the peculiar character which it communicates to the respiration and voice; but it does not necessarily involve any result inconsistent with the continuance of life. The inflammation of the mucous membrane of the *glottis* and *larynx* is a much more serious circumstance; and unless moderated by art, or subsiding spontaneously under the retrocession of the original disease, it may very speedily prove the cause of inevitable death.

The membrane investing the arytenoid cartilages then becomes swelled, thickened, and vascular; at first dry, it becomes afterwards the seat of a secretion of viscid mucous fluid; the submucous filamentous tissue becomes swelled, and infiltrated with serous fluid; and as these two tissues, the mucous and submucous cellular, thus become inflamed and swelled, and their surface become covered by the morbid secretion, they encroach on and diminish the opening of the *glottis*, until it is so much contracted, as to be incapable of admitting of the alternate motions of inspiration and expiration. These motions then become limited, imperfect, and inadequate, and eventually frequent, hurried, and laborious. The motion of the blood through the branches of the pulmonary artery becomes impeded and retarded, and accumulation in the trunk of the artery and the right ventricle forthwith ensues. The cardiac contractions become frequent, quick, and feeble; and the patient dies of a species of secondary asphyxia,—chronic certainly in progress and duration, but not on that account less certainly fatal.

It may become a natural question, what is the precise pathological and nosological character of this disease? It can by no means be regarded as mere *Cynanche Tonsillaris*, for the affection of the tonsils is often very moderate; and supposing it were greater, it is trifling compared with the disorder of the parts forming the base of the tongue, the palate, the inner coverings of the inferior jaw, and the upper region of the *pharynx*.

If this disease has been confounded with Quinsy, I think it is certain that practical authors have not accurately marked its progress, tendency, and termination. Quinsy, or *Cynanche Tonsillaris*, it has been said, may terminate by resolution, or by suppuration and ulceration; and when quinsy proves fatal, it is said that it does so by the pressure of so large an abscess on the *larynx* causing suffocation, or by discharging its matter into the *larynx*.

The inflammatory disease now mentioned, if really an intense degree of quinsy, differs, however, entirely from that disease, as has been already seen by the parts in which it is seated, and still more so by its mode of termination. Suppuration is either a rare result, or takes place so slowly that the patient expires long before it occurs. Though I have witnessed only one fatal case of the disease, I conceive that the phenomena of that case sufficiently justify the inference that I now draw regarding the mode in which death is produced.

Nor can it with greater justice be regarded as referable to the disease styled *Cynanche Pharyngea* by Eller, Sauvages, and Cullen; since the affection of the *pharynx* is only one of several parts of the diseased action, and the inflammatory swelling extends both forwards and laterally. In the *third* place, it cannot be said to be an example of mere laryngeal inflammation, since it does not commence with this, and if treated with prompt, active, and seasonable measures, it could not induce the affection of the *larynx* at all.

This disease, indeed, is a remarkable instance of the difficulty, if not the impracticability, of referring some morbid actions with certainty to any individual tissue. In this instance it is neither the mucous membrane nor the submucous cellular tissue alone that is affected, but both. Nor does it affect the tonsils, the *velum*, and the *uvula*, separately or generally, nor the tongue, the sublingual or submaxillary glands, nor the pharynx, the glottis, nor indeed any separate part of the apparatus of deglutition, or respiration, or voice. But the morbid action invades at first the mucous, and especially the submucous and intermuscular filamentous tissue of the tongue, the *epiglottis*, the inner coverings of the inferior jaw, the palate and throat, and the upper region of the *pharynx*, nearly at the same time and in the same degree, and then consecutively and secondarily, the laryngeal mucous membrane, where it covers the arytenoid cartilages and constitutes the *glottis*, laryngeal ventricles, and vocal chords. In this manner the disease, which commences as inflammation of the tongue, tonsils, palate, and *pharynx*, terminates in *laryngitis* and *asphyxia*, slow, indeed, and progressive in its movements, but not less certain in its effects.

When I first saw this complicated form of disease, in a case presently to be related, the season for active treatment was past; and it appeared to me unsafe, if not detrimental, to employ the measures which, at an earlier stage of its progress, I should have certainly put in operation. With incapacity to depress the lower jaw, or to swallow even fluids or medicine, the pulse was extremely small and feeble, and between 106 and 114 in the minute. General evacuation, which in other circumstances I should have attempted, appeared to me unsafe; and I attempted chiefly to deplete locally, which was done by leeches, and scarifying the tonsils. The blood, however, which issued from the incisions thus made created irritation of the *glottis* so urgent as to threaten suffocation; and I felt that it was unsafe to repeat a measure so ambiguous in effect in such circumstances.

In order, however, to communicate a clear idea of this form of glosso-pharyngeal inflammation in its exquisite degree, unmodified by remedies, and in the same degree when modified by the seasonable adoption of remedies, I shall submit the leading circumstances of two cases.

Ann Mackenzie, aged 28, a servant girl, of corpulent figure and plethoric appearance, was admitted into the Clinical Wards of the Royal Infirmary on the 16th of October 1833, while I was acting for my friend Dr Christison.

She was quite unable to speak or articulate, so as to give any account of herself; but an attendant by whom she was accompanied stated, that on Sunday the 12th she was attacked with pain of the throat, and some difficulty in swallowing, which was at first disregarded. The pain increased rapidly, with most urgent difficulty of swallowing and speaking, and a profuse discharge of ropy saliva from the mouth.

Upon admission, she was quite unable to speak or swallow; and when drink was given her, she indicated by signs, that the attempt caused acute pain in the throat. When she was requested to make the attempt, by pouring into her mouth a small quantity of fluid, she allowed it to trickle into the throat without moving the tongue; but it immediately produced urgent suffocation, and part of it regurgitated forcibly through the nostrils with gasping and coughing.

She was unable to depress the jaw so as to allow the throat to be inspected, but the tonsils and *uvula* were felt by the finger swelled and prominent; much general and painful enlargement of the base and margins of the tongue, and the parts lining the inner surface of the jaw, were felt; and considerable diffuse swelling of the external surface of the neck and throat on each side towards the angle of the jaws was obvious.

The voice, when she attempted to speak, assumed the form of inarticulate snivelling through the nose; and the saliva flowed incessantly from the mouth, which continued half open. The *larynx* did not ascend in attempting deglutition.

Respiration was rather difficult and panting, but feeble; and the pulse was very small, from 104 to 116.

Twelve leeches were directed to be applied to the external surface of the throat, near the angle of the jaw; and a wineglassful of a solution consisting of one ounce and a-half of sulphate of magnesia, and two grains of tartrate of antimony, in sixteen ounces of water, was directed to be taken every half hour until the bowels were freely moved.

In the evening the leeches had bled freely, and were followed by some tendency to faintness, but not much abatement of the difficulty and pain of deglutition. A blister was then applied, and rose imperfectly. As she was quite unable to swallow the saline antimonial solution, an enema was administered, and was followed by a single alvine evacuation.

On the 17th, the *velum* continued much swelled, and behind the tonsils were felt enlarged, and the base of the tongue continued tumid and incapable of motion. A quantity of viscid mucus was discharged from the tonsils in the morning with some relief. But the voice continued as nasal as formerly; and when fluids were put into the mouth, they were invariably coughed backwards with much gasping, or driven through the nostrils by forcible expiration.

Several punctures were now made in the anterior part of the *uvula*; but the blood which issued from them, by trickling down upon the *glottis*, induced much gasping, and threatened suffocation. The pulse continued at 104, but very small and feeble.

A purgative injection was ordered to be administered, and the inhalation of tepid vapour was directed, with an antispasmodic anodyne at bed time.

In the afternoon of the same day, deglutition became still more difficult and impracticable; and the nasal respiration and voice continued, with great general feebleness. The purgative *enema* was repeated, and afterwards an anodyne *enema* was administered, in order to relieve the difficulty of respiration, which seemed urgent, with very weak pulse.

About twelve the breathing became stertorous; she appeared to fall into a state of insensibility to all external impressions; and she died at two in the morning of the 18th.

On inspecting the body on the 19th, the following appearances were found.

The tonsils presented the appearance of having contained puriform mucus which had been discharged. The swelling of the *uvula* was almost gone; but the base of the tongue was tumid, hard, and much distended with blood and serum infiltrated in its cellular tissue, and the parts between that and the angle of the jaw were in like manner infiltrated.

The *glottis* was pervious; but the membrane forming it was covered with a coating of opaque whitish puriform matter, which was also found in the ventricles of the *larynx*. The *epiglottis* was thickened and opaque; and mucous fluid was found in the angles between it and the lateral folds of the base of the tongue.

The bronchial membrane was reddened, and the tubes contained puriform mucous fluid. The lungs were gorged with blood. The pulmonary artery and right ventricle were much distended with dark-coloured blood, fluid and in clots.

The vessels of the brain were also much loaded.

The necroscopic appearances in this case would be quite inadequate to account for the concurrence and succession of symptoms, were they not considered in attentive comparison with the history of the case, and the progressive advancement of the disease. I think it manifest that the external swelling of the throat, the impracticability of depressing the jaw, the incapacity of causing the tongue to move backwards and reflect the *epiglottis*, and of raising and protruding the *larynx*, denote clearly a general inflammatory disorder of the base of the tongue, and the filamentous tissue between it and the external skin of the neck, extending on each side to the angles of the jaw, and backwards to the *pharynx*. I think also that the history of the progress of the case shows, that this was the commencement of the malady, and that it was only when the tumefaction of the parts impeded deglutition entirely, and began to induce incessant laryngeal irritation, that the patient felt it requisite to apply for relief. At this time, however, the inflammation of the arytenoid mucous membrane, and the irritation and contraction of the glottis, were already so considerable, as to prevent completely the introduction of medicine by the throat. With the view of abating the swelling of the base of the tongue, general bloodletting appeared the most probable remedy; but the feebleness of the patient appeared to form a strong contraindication to this measure. The next remedy, therefore, was local blood-letting; but it is doubtful whether at this late period of the disease it might not be detrimental in increasing weakness. Direct bleeding from the parts was next tried; but the irritation occasioned by the blood dropping down on the *larynx* in a person already unable to depress the jaw, or move the tongue, or raise the *larynx*, or to contract the palate for expectoration, was so urgent and threatening, as to render this measure highly inexpedient.

Upon the idea that in *Glossitis*, incisions into the tongue afford effectual relief, I proposed to attempt relief in this manner; but as the patient was very feeble, and unable to make the smallest effort, and as it was uncertain whether there was sufficient time to allow the blood thus evacuated to produce so much detumescence of the parts as might admit of the return of the power of deglutition and diminish the already established laryngeal inflammation, the proposition was abandoned.

The melancholy issue of this case, which seemed to the general observer merely an intense form of *paristhmitis* or tonsillar inflammation, led me to reflect on the probable means of obviating so unfavourable a catastrophe in a disease so apparently slight. When I observed the extent of the inflammatory tumefaction and infiltration, and considered the rapidity with which the disease, by interrupting deglutition, excites secondary laryngeal inflammation, it appeared to me that the only sure method was by the early adoption of appropriate means to subdue the glosso-pharyngeal inflammation, and thus prevent the continuance if not the accession of the laryngeal irritation.

It was some little time before a fit opportunity presented itself. Cases of inflamed sore throat, with more or less affection of the tongue and *pharynx* impeding deglutition, were not unfrequent during the months of November and December 1833, especially during the incessant wet weather, and in low damp situations, as the Cowgate and its vicinity, where I saw several of them. In all of these, however, though severe, the inflammation was much more partial than in the case of the girl Mackenzie. The parts affected were one or both tonsils, with the *uvula* and part of the *pharynx*, but the base of the tongue was in general unaffected, and little or no external swelling took place. In these cases also, though deglutition was much interrupted and impaired, it was only for a day or two. There was no nasal voice or respiration, and no profuse discharge of saliva from the mouth.

Miss G. aged 28, had been exposed to cold on the 10th of December 1833, and soon after complained of sore throat, with inability to depress the lower jaw, and difficult and painful deglutition, which increased to Sunday the 15th.

On Friday the 20th December, when deglutition was becoming more painful and difficult, I directed her to apply twelve leeches to the external surface of the throat, and to take some infusion of senna with salts. The medicine was taken, but the leeches were not applied; and on the following day some alleviation of the pain of the *fauces* and difficulty of swallowing ensued, and rendered her indifferent about further medical treatment. On the 22d, however, the sensation of pain and difficulty in swallowing recurred and became so urgent in the course of the night and in the following day, that I was requested to see her on the 23d.

I then found her quite incapable of swallowing even fluids, which when poured into the mouth regurgitated by the nostrils with much uneasiness and threatening suffocation. She was unable to depress the jaw and open the mouth sufficiently to expose the throat; a stream of saliva issued incessantly from the open mouth; the voice was inarticulate and snivelling; respiration was performed entirely through the nostrils, and so forcibly that every expiration was attended with a blowing noise, and impelled the flame of a candle. The countenance was at the same time red and swelled but haggard, the eyes injected and watery, and there was evident fulness of the whole external surface of the neck up to the angle of the jaw, where there was further some tenderness and pain on pressure. The tongue could not be protruded; and when the finger was introduced it was felt much and painfully enlarged at its basis.

Twelve leeches were directed to be applied to the throat, especially towards the right side, and the bleeding to be encouraged by the application of warm poultices; while six grains of calomel were given, and as many doses as could be got swallowed were directed to be taken, of a mixture of infusion of senna and solution of sulphate of magnesia.

On the 23d, the local bleeding was found to have abated slightly the external swelling; but the inability to depress the jaw or move the tongue in swallowing, and the difficulty and pain in attempting the act of deglutition, the sense of laryngeal irritation and suffocation, the nasal voice and respiration, and the regurgitation of all fluids through the nostrils, continued as intense and urgent as ever. The nostrils, indeed, were red and swelled, the countenance flushed, the eyes watery, the voice if possible less distinct, and more nasal; and all the symptoms indicated the transition of the disease to its second stage of laryngeal irritation and inflammation, and the probable eventual diminution or obliteration of the aperture of the glottis.

Notwithstanding all this distress and suffering, which it was extremely painful to witness, it was remarkable that the pulse was not above 84 or 86, and though small and feeble could not be denominated hard or wiry. The respiration was hitherto not much affected, that is, neither much more frequent than natural nor laborious. The patient complained of some headach, evidently from the distress referred to the throat, and the difficulty which the blood was beginning to experience in returning from the head.

It appeared to me after as attentive an examination of the throat by the finger, as the small extent to which the jaw could be depressed would admit, that this patient was proceeding rapidly to the state in which the girl Mackenzie was, when admitted into the Infirmary, and that, unless some efficient means of arresting the progress of the complaint were adopted, the case would terminate exactly in the same manner.

To counteract a result so inauspicious, a full blood-letting seemed the most probable remedy; but to this there were several apparent objections. The pulse was neither frequent nor hard, or full, and was rather feeble. The patient was extremely delicate and nervous, and had been repeatedly under treatment for those ailments incident to nervous, hysterical, and relaxed subjects.

After a good deal of consideration, however, and repeated examination of the pulse and the basis of the tongue, I was convinced that a blood-letting would, in the circumstances of this case, by diminishing the fulness of the vessels, render the action of the heart more free, open and natural, and the most likely to abate the hard painful tumefaction of the tongue, and its connections. I accordingly drew quickly by a large orifice eighteen ounces of blood, which having speedily rendered the face pale, and brought on a tendency to fainting, was stopped at that quantity. It presented the buffy coat in all the cups.

The patient felt almost immediate relief from the evacuation; for the painful tension at the throat and base of the tongue was sensibly abated. Quietness and the horizontal position were enjoined, and as the power of swallowing returned, the mixture of senna and solution of salts to be resumed.

This blood-letting was performed at half-past two o'clock; and it was gratifying in the evening between six and seven to observe the improvement in the course of four hours. The patient was now in comparative ease, could swallow fluids in small quantity, with a little effort, did not expire through the nostrils with the same blowing noise as last night and this morning, experienced almost no regurgitation of fluids through these passages, and the discharge of *saliva* was less profuse. She continued, however, unable to depress the jaw or open the mouth.

The orifice of the vein was again opened, and about ten ounces more blood were allowed to flow, while the patient was kept in the horizontal position, until the countenance and lips became a little pale. A blister was then applied to the anterior and lateral parts of the neck; and the *aqua acetatis ammoniæ* was directed to be given in half-drachm doses.

The second blood-letting, though small, was not less decidedly curative than the first. The same evening the power of deglutition returned, and the patient swallowed drink, and the cathartic mixture with comparative ease, and without regurgitation through the nostrils. A good night ensued, during which more sleep was obtained than for several nights past.

The following morning, viz. the 25th December, the nasal voice and respiration were very much abated, and the natural laryngeal voice was returning; the saliva no longer flowed from the mouth, which could now be closed; the lower jaw could be depressed, and allowed more of the throat to be seen; the eyes were no longer red, prominent, and watery, and the countenance, though pale, had a less anxious and distended aspect. The tongue could also be protruded a little.

The blister had risen well, and the surface was directed to be dressed with resinous ointment. The bowels had been moved several times, and the tongue was becoming cleaner. The pulse had fallen to 68, but was softer and fuller than before the blood-letting.

The only circumstance deserving particular notice was, that this patient having, contrary to express injunctions, persisted in assuming the erect position, fainted completely, and remained for several minutes in a state of *syncope.*

In the course of this day much improvement took place. The power of moving the tongue and elevating the larynx and swallowing not only fluids, but even softened solids, was established in the course of the evening; the lower jaw could be depressed to a greater extent, so as to expose the throat; the external swelling was gone so far as could be judged, allowing for the reddened diffuse swelling occasioned by the application of the blister; nasal respiration was gone; and the nasal membrane merely retained a degree of sensibility, which was rapidly subsiding. Next day the voice had entirely lost its nasal tone; and deglutition was still more perfect and easy.

After this period the patient improved rapidly; and the treatment was confined to the regular and periodical management of the alimentary canal, and its functions. Convalescence took place slowly, in consequence of the nervous habit of the patient, and it was some time before strength was re-established. But no symptom of the original glosso-pharyngeal inflammation remained.

The only circumstance that gave uneasiness was an irritative cough, very troublesome in the morning. For this I recommended her to take as soon as she rose a teacupful of tepid milk and water,—a remedy very simple, but which I have found effectual in many varieties of cough resulting from relaxation or irritation of the mucous membrane of the fauces, larynx, or windpipe, without serious lesion of the lungs.

The disease exemplified in the two cases now described may, I think, with great justice, be regarded chiefly as a species of *glossitis*, or inflammation of the tongue,—an *Angina lingualis*. The reasons on which this opinion rests, have been already in a great measure assigned; but they may be shortly specified in the following manner. *First*, the painful tumefaction of the body, and especially the base of the tongue felt by the finger, which not only prevents the jaw from being depressed, but gives rise to swelling visible in the external surface of the neck. *Secondly*, the incapacity to move the tongue backwards and upwards in the act of deglutition. *Thirdly*, the incapacity to move the tongue in the nice and delicate motions required for articulate speech. And *fourthly*, the incapacity to contract the palate and *uvula*, and apply them over the posterior nasal aperture. These I conceive to constitute the essential characters of the disease, and they induce the others which are therefore accessory *(signa epigenomena,)* viz. the regurgitation of fluids through the nostrils; the nasal respiration and voice; the inarticulate snivelling; the incapacity to reflect the *epiglottis*; and the consequent irritation of the *glottis* and arytenoid membrane.

Though I have denominated this lingual inflammation *Diffuse*, in contradistinction to that which is circumscribed, I do not thereby mean that it is *disjunctive*, or of the kind which produces suppuration and suppurative disunion of parts in preference to albuminous effusion and adhesion. That it may produce suppuration is probable; but the rapidity with which it proceeds to the fatal termination by affecting the *glottis*, must generally preclude this result. It consists chiefly in general tumefaction of the parts by excessive distension of their vessels, and effusion of sero-albuminous fluid, and serum into the submucous cellular tissue.

I should not have ventured to dwell at so great length on this affection, were I not convinced, from the accounts of authors, that it has been, with certain exceptions, either overlooked entirely, or so imperfectly and inaccurately described, that it may be justly said to have been confounded with ordinary quinsy or tonsillar inflammation. It is a singular fact, that this disease appears to have been better known by several of the ancient physicians than by any of the modern systematic or practical authors.

Aretaeus, to whom we are indebted for much accurate information on diseases, describes, under the head of Συναγχη, a species of *Angina* of an acute character, κατοξυ μεν το παθος, in which, in consequence of inflammation spreading from the tonsils, *epiglottis*, pharyngeal cavity, *uvula*, and top of the windpipe, the tongue becomes so large as to fill the entire cavity of the mouth, and be thrust beyond the teeth ; ευτε προβαλλουσι των οδοντων την γλωτταν ὑπερβολη μεγεθεος. πιμπλησι γαρ την χωραν του στοματος, και το περιττον ταυτης υπερ τους οδοντας εκχειται. and afterwards he adds γλῶσσα προπετης υπερ τους οδοντας και τα χειλεα ; in which the saliva issues profusely from the mouth, σιαλοχοοι, φλεγμα παχυτατον; the face is flushed and swelled, ερυθροι τα προσωπα και επηρμενοι ; the eyes staring, prominent, and injected, οφθαλμοι εξισχοντες, αναπετεες, εξερυθροι ; the drink regurgitates by the nostrils, το ποτον ες τας ῥινας ανακοπτεται, with much struggling anxiety and threatened suffocation, and loss of voice, αφωνια.

In his account of the subsequent course of this malady, he represents it to produce either languid and imperfect respiration, or finally suffocation, by interrupting the passage of air into the chest, εισπνεουσι μικρον πανυ ες τε και απεπνιχθησαν, ἐμφραγεισης της ες τον θωρηκα διοδου ; or abscess takes place, and the patients escape with great difficulty and danger.

It is unfortunate, however, that he vitiates his description by introducing the distinction of two forms of the disease,—one in which he represents the parts to be enlarged and swelled ; the other in which he supposes them to be collapsed and contracted.

He has a just idea of the seat of the disease, which he states to consist in inflammation, not only of the tonsils, but of the pharynx and whole mouth ; ξυνεστι δε τοισι μεν κυναγχικοισι φλεγμονη παρισθμιων, φαρυγγεθρου, παντος του στοματος.*

It is remarkable, that, in this description of Aretaeus, we find the symptom of regurgitation of fluids by the nostrils distinctly specified, and nevertheless omitted by every modern author who has mentioned the varieties of *Angina*. Nothing perhaps proves so clearly the accurate observation of Aretaeus as this circumstance ; since it is a symptom never observed in any other species of *Angina*, and with the nasal and inarticulate tone of the voice may be regarded as almost pathognomonic.

In the beginning of his third book, *De Morbis Acutis*, Cœlius Aurelianus enumerates, when treating of Cynanche, an assemblage and train of symptoms very similar to those of *Angina lingualis*, and evidently of a character much more intense than those of ordinary tonsillar inflammation. After mentioning the difficulty of swallowing fluids secreted by the mouth, which are accumulated, he says, like saliva, he adds, that, as the disease proceeds, the parts become generally swelled ; " *omnium tumor efficitur,*

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* Aretaei, Cappadocis Morb. Acut. Lib. i. Cap. vii. Lugduni Bat. 1735. Fol.

colli atque vultus, et humoris crassioris ac salivarum fluor, oculi prominentes, sanguinolenti, et venarum extentio." He then proceeds to enumerate, in the more advanced form of the disease, the swelling, and protrusion of the tongue, *(linguæ ultra dentes ad exteriora prolapsio,)* the anxiety, the indistinct confused mode of speech, and finally, the loss of voice; *item loquutio non articulata, sed confusa, atque cum dolore; vocis amputatio*; the regurgitation of fluids, *(recursio sive recursus poti liquoris)*; loss of pulse, interrupted respiration, livescent countenance, extreme feebleness, and death; *pulsus defectio quam Græci* ασφυγμιαν *vocant, et quibusdan caninus vocis sonitus. Item vultus et oculorum cavitas*; *frontis extentio, color plumbeus, spirationis difficultas plurima, nullo manifesto tumore, sive inflatione aliqua apparente neque in internis neque in externis partis, hebetudo plurima atque imbecillitas ægrotantis, et celerrimus vel acutus cum præfocatione, mortis effectus.*[*]

It is certainly a remarkable circumstance, that, though the inarticulate, confused, or nasal speech, and the regurgitation of fluids, are expressly specified among the symptoms of this disorder by both the authors now referred to, they are never mentioned or alluded to by any of the modern systematic or practical authors from Lieutaud, Sauvages, and Cullen, to Pinel, Frank, Young, Mason Good, and Hildenbrand. In the description even of the last author, though the most complete, while the nasal voice is mentioned, regurgitation of fluids is entirely omitted.

It appears further, that Cælius Aurelianus had formed a very just conception of the parts affected in this complaint from the circumstance, that he impresses particularly the necessity not only of venesection and local bleeding by the application of leeches, but of scarifying the tongue, the fauces, and the palate, by a long thin lancet.

From some passages in the writings of Julius Cæsar Aranzi, Professor of Anatomy at Bologna in the sixteenth century, there is some reason to believe that he was aware of the peculiar character and tendency of this disorder. After his time, however, all the authors with whose writings I am most familiar, overlook it entirely, or confound it with ordinary tonsillar inflammation. The history, however, already given, shows, I think, that from this it is entirely distinct, and that it partakes more of a lingual than a pharyngeal inflammation. It also shows, that the disease ought to be opposed early by efficient evacuation, in order to realize any hopes of counteracting its fatal tendency.

43, *Queen Street*, 15*th May* 1834.

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[*] Cælii Aureliani Sinensis de Morb. Acutis et Chron. Lib. iii. cap. ii.

ART. III.—*On the Mortality of the Infantry of the French Army.** By HENRY MARSHALL, Esq. Deputy-Inspector-General of Army Hospitals.

STATEMENT showing the Strength of the Infantry of the line, and the Royal Guard (commissioned officers excepted) from the years 1820 to 1826 inclusive, the number of deaths, and the annual ratio per cent. of the strength.

	Strength.	Died.	Annual ratio of mortality.
1820,	122,084	2582	2.1
1821,	115,287	1799	1.5
1822,	140,921	3354	2.3
1823,	77,737	3097	3.9
1824,	115,420	2250	1.9
1825,	117,425	1823	1.5
1826,	112,604	2302	2
Mean of 7 years,	114,497	2458	2.1

The ratio of mortality in 1823 was unusually high, in consequence of a number of the sick of the army employed in Spain having been transferred to the hospitals in France. By omitting this year, and limiting the calculation to the other six years, the result is shown by the following statement.

Mean Strength.	Mean annual deaths.	Ratio of deaths per cent.
120,624	2352	1.94

Statement of the Strength, Mortality, and Ratio of Mortality of the Infantry of the French army, divided into classes according to their ranks or occupations for a period of six years.

Classes.	Strength.	Mean annual number of deaths.	Ratio of mortality per cent.
Non-commissioned officers,	24,408	266	1.08
Drummers, -	3,917	34	.8
Musicians, -	918	14	1.5
Labourers, -	383	2	.8
Privates, -	90,978	2036	2.2
	120,624	2352	1.94

This table shows that the ratio of mortality in some classes of the army is considerably less than in others,—a circumstance which probably arises from the comforts obtained from higher pay, and from being less exposed to variations of temperature, especially on night duty. Non-commissioned officers and drummers are better paid than privates, and enjoy a comparative immunity from exposure to changes of weather, and the ratio of mortality is considerably lower in these classes than in the rank and file.

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* Vide Essai sur la Mortalité dans l'Infanterie Française Par M. Benoiston de Chateauneuf, Annales d'Hygiène Publique.—Annales des Sciences Naturelles, 1827. Recherches Statistiques du Departement de la Seine.

Statement of the Strength, Mortality, and Ratio of Mortality of the Royal Guard, divided into classes according to their employment during the six years already specified.

Classes.	Strength.	Mean annual number of deaths.	Ratio of mortality per cent.
Non-commissioned officers,	2,648	24	.9
Drummers, -	395	2	.5
Musicians, -	232	2	.8
Labourers, -	36	—	—
Privates, (rank & file,)	10,612	180	1.7
Mean of 6 years, -	13,923	208	1.4

The Royal Guard receive higher pay and better rations than the infantry of the line; they are also better clothed, and enjoy more comfortable accommodation. To these meliorating circumstances may in all probability be ascribed the comparatively low ratio of mortality which occurs in that privileged branch of the army. The ratio of mortality in the classes of the Royal Guard least exposed to variations of weather and temperature, namely, non-commissioned officers, drummers, and musicians, is considerably lower than among the privates. These returns uniformly show the beneficial influence of attention to the diet and comforts of soldiers.

By a report of the Minister at War, it appears that the annual ratio of mortality in the whole French army, including the troops employed in Corsica, was, in 1822, 2.79, and in 1823, 2.83 per cent.

The foregoing returns show that the ratio of mortality in the infantry employed in France was, from the year 1820 to 1826 inclusive, 2.1 per cent. and by excluding 1823, it is reduced to 1.94 per cent. This latter ratio is nearly one-fourth higher than the mortality of the troops employed in the united kingdom, which may be estimated at 1.5 per cent. The mean annual strength of the troops employed in Ireland for a period of thirty-two years was 36.921, and the mean annual number of deaths 576, or 1.5 per cent. and the mean strength of the troops employed in the united kingdom for a period of ten years, including the year 1828, was 46,460, and the deaths 721, or 1.5 per cent. To what circumstances are we to attribute the higher rate of mortality in the French infantry? Various causes may be assigned, but what degree of influence each may have it is difficult to determine. The rate of mortality among the whole inhabitants of France is higher than that of the united kingdom. In France the rate of mortality among persons of both sexes at 24 years of age, which I presume is about the mean age of the French army, is 1.3 per cent, (*Duvillard.*) The mean rate of mortality among males between the age of 20 and 30 in a number of the departments of France has been found to be 1.25 per cent. I should suppose that the mean period of life of the British army is about 28 years of age, and, according to the law of mortality at Carlisle, the ratio of mortality of this age is .87 per cent per annum.

The conscription, which has been emphatically called an impost of blood, and its consequences, both immediate and remote, must contribute considerably to increase the rate of the mortality of the French army. Conscripts join the army shortly after they reach twenty years of age, and serve six years. French soldiers seldom volunteer to extend their services after they have completed the compulsory period of service, consequently there are few men in the army above thirty years of age. The precise ages of 14,455 soldiers who died were well known, and of this number 12,455, or 83 per cent, were between the age of twenty-one and twenty-seven years. The rate of mortality among very young soldiers is commonly higher, even when the service is voluntary, than among men that have attained the vigorous period of life, and who have adopted the habits of the army, and become reconciled to the restraints of military discipline. With few exceptions the British army, especially the infantry, is composed of men between the age of eighteen and forty, consequently there is always a large portion of a corps in the primest period of life. The mean period of life of the men of a regiment I should estimate to be about twenty-seven or twenty-eight years of age. Under similar circumstances, with respect to age and climate, the rate of mortality seems, both in the united kingdom and in France, to be higher in military than in civil life. The aggregation of mankind into masses is unfavourable both to moral and physical health. Various reasons may be assigned for a higher rate of mortality among troops than in civil life, especially among recruits and young soldiers; such as great fatigue, either from remaining long in one position at drill and exercise, or in marching; night duty, and exposure to considerable variations of temperature; great change in the habits of life and diet; the restraints of military discipline. To these circumstances may be added certain moral influences, such as—aversion to a military life, involuntary separation from former associates, despondency, love of home, intemperance, and other excesses. Many of these causes operate injuriously upon the health of individuals in proportion to their youth, and hence the propriety of not enlisting men until both mind and body be matured, so as to qualify them for the various duties of a soldier, and to enable them to endure the privations of a military life. Any exercise to which a soldier may be exposed which is disproportioned to his strength, is a fertile source of disease. "Les soldats qui ont moins de vingt ans resistent difficilement aux fatigues de la guerre. Ce sont ceux qui ont peri les premiers dans la retraite de Moscou."—(*Sarlandiere.*) Conscripts are peculiarly liable to the moral causes of impaired health, many of which cannot be obviated, as they follow the victim wherever he goes, and under whatever circumstances he may be placed. This must obviously be more or less the case in all compulsory levies. Nostalgia seems to be much more frequent in the French than in the British army. During the seven years embraced in the foregoing returns, 97 men died from this cause. Suicide is also apparently much more frequent in the French army. Duelling, which never occurs among the non-commissioned officers and privates of the British army, occasions about one death annually for every 1000 men in the French service.

May not the comparatively low ratio of mortality in the British army be in part owing to greater care in the selection of recruits than obtains in the French military service? This is a very difficult question to solve. The rules and usages of the two countries in regard to the examination of men for the army are so dissimilar, that the results will not admit of close comparison. It may, however, be useful to give a brief account of the mode by which the respective armies of France and England are recruited, as far as health and efficiency are concerned.

Until the period of the Revolution, the French army was recruited by voluntary levies. Since 1798 it has been recruited both by voluntary enlistment and by conscription. Volunteers may be enlisted at eighteen years of age, and their period of service is eight years. A small portion of the recruits required is obtained by voluntary enlistment; for, on an average of thirteen years, the mean annual number thus engaged amounted only to about 3000. The total annual number of men required to fill up the vacancies in the army is about 60,000. Conscription is therefore the chief mode of recruiting the French army. According to the conscription law, every male upon reaching twenty years of age, is bound to enrol himself at the office of the municipality. Each canton is assessed with a certain number of conscripts, in proportion to the population, as taken by the last census. Under the direction of a municipal officer, a list of the conscripts is made up. The law exempts individuals, under particular circumstances, from serving; and conscripts who think they have a right to be exempted claim their privilege, and obtain it, if their claim be found relevant. Tickets regularly numbered, corresponding to the names on the list, are publicly deposited in an urn, and drawn out by the conscripts themselves, or by their friends. The lot falls upon those individuals who draw numbers below the amount of the contingent ordered to be levied from the commune or canton. The conscript who draws a number below the amount of the quota required is forthwith measured, and, by the law of 1818, should he not be 1 metre, 570 mil. (5 feet, 2 inches, English,) in height, he is exempted from serving. Should he be sufficiently tall, he is next examined by medical officers of the army, or by private medical practitioners, who give their opinion in regard to the fitness or unfitness of the men in question. Medical officers in this duty merely assist the civil authorities by giving their opinion. The final responsibility of either approving or exempting a conscript rests with the civil authorities. The whole proceedings of the authorities connected with the conscription are revised in open court by a board composed of civil and military officers, which may be called a recruiting board.

Statement showing the result of the Conscription in the Department of the Seine from 1800 to 1810 inclusive, (eleven years.)

Numbers which reached the age of the conscription, (twenty years,)				44,543
Amount of the different levies,			14,935	
Exempted from serving on account of	Low stature,	4520		
	Deformities,	1488		
	Infirmities,	9660		
			15,668	
Not drawn,			13,940	
			44,543	

Exempted from serving in consequence of		Relative ratio of the causes of exemption per cent.	Ratio of exemptions per cent. of the numbers examined.	
Low stature,	4520	28.8	14.6	
Deformities,	1488	9.6	4.9	36.2
Infirmities,	9660	61.7	31.3	
		100	51.0	

From this return we learn, that 14.6 per cent. of the conscripts examined (30,603) had not attained the minimum height of soldiers during the war, namely, 1 metre, 544 mil., – 5 feet, ⅞ of an inch, English; and that 36.2 per cent. was found unfit for military service, in consequence of being deformed or infirm, defects which in this country are usually denominated medical objections.

Statement showing the operation of the Conscription in the Department of the Seine from the year 1816 to 1823 inclusive, (eight years.)

Numbers which reached the conscription age, -				40,576
Total amount of the levies, -			5825	
Exempted from serving on account of	Low stature,	1483		
	Deformities,	1021		
	Infirmities,	3401		
			5,905	
Not drawn, - - -			28,846	
			40,576	

Causes of exemption.		Relative ratio per cent. of the causes of exemption.	Ratio of exemption per cent. of the numbers examined.	
Low stature,	1483	25.	12.6	
Deformities,	1021	17.	8.7	37.6
Infirmities, -	3401	58.	29.	
	5905	100	50.3	

The minimum height of the conscripts was altered from 1 metre 544 mil. 5 feet ⅞ of an inch English, to 1 metre 570 mil. 5 feet 2 inches English, in 1818. The mean height of the approved conscripts belonging to the city of Paris from 1816 to 1823, was 1 metre, 683 mil. 5 feet 6½ inches English. The mean height of man, according to the valuable experiments of Quetelet, is as follows:—

Age.		Stature.
17,		5 feet 4 inch ⅓,
18,	- -	5 — 5 — ¼,
20,	-	5 — 5 — ⅘,
25,	- -	5 — 6 — ⅙,

A certain degree of stature is indispensably necessary to qualify men for being soldiers. It is required partly on account of appearance, but chiefly because stature is considered a tolerably accurate measure of strength, which is necessary to enable a soldier to surmount the fatigues incident to a military life. Until 1701, a man was not considered unfit for military service in the French army on account of low stature; but about that time the minimum height of recruits for the infantry was fixed at 5 feet (French), 1 metre 624 mil. 5 feet 4 inches English, being two inches higher than the minimum height at the present time. The minimum height of the carabiniers and other dragoon corps was then fixed at nearly what it is by the present regulations. The following statement shows the minimum height of the different classes of the French army.

	French measure.			English measure.		
	feet.	inches.	lines.	feet.	inches.	eighths.
Carabiniers, -	5	5	6	5	9	$\frac{6}{8}$
Cuirassiers, Artillery,	5	3	6	5	7	$\frac{6}{8}$
Dragoons, Artillery, Labourers, Engineers,	5	2	6	5	6	$\frac{4}{8}$
Chasseurs and Hussars,	5	1	0	5	5	$\frac{2}{8}$
Infantry, -	4	10	0	5	2	0

The mean height of the Inniskilling dragoons is 5 feet 9$\frac{2}{8}$, so that the corps of French carabiniers are taller than the heavy dragoons in the British army.

The mean annual ratio of conscripts exempted from serving in the army on account of low stature and bodily infirmities has been for a number of years past about 54 per cent. At one time, it appears that the annual ratio of conscripts examined and found unfit in consequence of these causes was not more than 29 per cent. Even at the minimum height of 1 metre, 570 mil., 5 feet 2 inches English, which is the present regulation, some of the poor cantons, where the growth of man is stinted, and the period when he reaches his full height is retarded, have not been able to furnish the full quota of efficient men for the army. It has been found, by the operation of the conscription law, that the mean ratio of males which reach the age of twenty in France is about 1 to every 100 of the inhabitants of the whole kingdom. A French author, who has been much engaged in carrying into effect the provisions of the conscription law, and devoted great attention to the subject, endeavours to account for the higher ratio of exemptions of conscripts on account of low stature and infirmities, by alleging, that the people have become greatly degenerated, and chiefly by the effects of the conscription. He seems to think that Frenchmen in general have not now the vigour and strength they formerly possessed; and this, he thinks, arises from the finest of the youth being prevented from marrying during the prime of life. Future generations will, he thinks, continue to be deteriorated by the evil influence of the conscription. *

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* Observations sur le Recruitement, par M. de Petigny, Counseiller de Prefecture de Department de Loir-et-Cher.

But, notwithstanding the numbers exempted on account of deformities and infirmities, the surgeons of regiments allege, that very inefficient men are approved by recruiting boards, which statement may be more or less correct. The medical examinations of conscripts resembles much more the inspection of alleged disabled soldiers in the British service, than the examination of recruits. Unless it be evident, that a soldier or a conscript is *unfit* for service, the former is not discharged, and the latter is not exempted from joining the army. The onus of proving that a conscript labours under an infirmity seems in a great degree to devolve on himself; and, as the simulation of infirmities is much practised in France, and perhaps in every country where men are raised by compulsory assessments, medical officers are cautious in practically admitting the existence of disabilities which are not obvious. It is alleged that the conscripts are sometimes examined by civil medical practitioners, who are unacquainted with the duties of soldiers, and whose opinions, it is supposed, are sometimes influenced by bribes; that the young men are not invariably inspected in a state of nudity; that the examination is sometimes conducted in a hurried manner, and even with candle-light, for the purpose of allowing the recruiting board to proceed quickly to another station. When a conscript draws a number above the complement required, he and his friends are in high spirits; and when a number within the conscriptional assessment is drawn, the spectators, whose own prospect of escaping the impost is thereby improved, exult without any consideration for the feelings of the drawers. The interests of a great many conscripts may be involved in the approval or disapproval of a man who draws a number within the complement. Consequently, the exempting of an individual from serving becomes a business of some importance. The civilian members of the recruiting board are more numerous than the military members, by which means the latter are frequently out-voted when they wish to exempt an ineligible conscript whose prospective efficiency is doubtful. This circumstance may happen frequently, for there are many alleged disabilities, of which the members of a board may think themselves qualified to entertain an opinion. Such, for example, as when a surgeon considers a man ineligible on account of being a "*sujet mou*," or has a "*faibleconstitution*," or "*pieds tres-plats*," or "*jambes arquées*." In compulsory levies, many individuals, who are in every respect *fit* for military service, may be exempted from serving on account of the simulation of disabilities; and really *unfit* persons may occasionally be approved, when their infirmity is not obvious, and when they are unable to prove its existence by moral evidence. Medical officers, who have had much experience in the duty of inspecting alleged infirm soldiers as a preliminary measure to their being discharged, will easily conceive how difficult it must be, on many occasions, to appreciate the efficiency of conscripts, the great majority of whom are unwilling to serve. To obviate the successful simulation of disabilities, the medical officers who may be employed in this highly important duty of examining conscripts, are recommended by Beaupré to furnish themselves with probes, scoops, and sounds, a microscope, and some concave and convex spectacles. The latter instruments are essentially required to detect impostors, who feign shortness of sight. The fear of being deceived by the simulation of disabilities, may induce medical officers to approve of conscripts, whose efficiency is in some respects doubtful.

The British army, as is well-known, is recruited by voluntary levies. Volunteers, when they are required, may be enlisted at the head quarters of regiments, or regimental depots, and by soldiers acting under the orders of subdivisional officers attached to recruiting districts, of which there are nine in the united kingdom, namely, London, Coventry, Bristol, Leeds, Liverpool, Scotland, (comprehending Glasgow and Edinburgh) Dublin, Cork, and Newry. The staff at each of these districts consists of an inspecting field-officer, an adjutant, a pay-master. and a surgeon. The elements of stature and period of life in volunteers belong exclusively to the province of the military branch of the service, while those of health and activity are usually left to the decision of the medical officer. The minimum age at which volunteers may be enlisted is sixteen years; but as soldiers, according to the regulations, are not entitled to reckon service, as a claim for a pension, before eighteen years of age, recruits commonly allege that they have reached that period of life. The maximum age is twenty-four years. As all the information which can be obtained respecting the age of recruits is procured from themselves, it is not be presumed that the statements in that respect are always very accurate.

As a means of appreciating the efficiency of men in regard to strength, the stature of recruits deserves much consideration. For a similar purpose, I would suggest that recruits should be weighed as well as measured. The chief qualities which require to be attended to in the examination of volunteers for the army are age, weight, stature, health, and condition of the organs of sense, with agility of the limbs. A man may be the requisite height, but unless he is also a certain weight, he may not be able to perform the duties of a soldier, or to endure the fatigues incident to the army. Every specific means of appreciating the efficiency of a recruit, which would be similarly interpreted by different examiners, is of much importance. Hitherto it has been customary to estimate the strength, indicated by the bulk of recruits by the eye; and until comparatively late years, the same indefinite plan was adopted in regard to the stature. As a measure of strength, perhaps the weight of young men is a better means of estimating their efficiency than stature. It is a definite quality which is of great importance where recruits are to undergo more than one inspection, and by different examiners. According to the investigations of Quetelet, the mean weight of young men at 17 years of age, is 116 lb. 9 oz. Avoirdupois.

18 do. 127 9⅓
20 do. 132 7⅓
25 do. 138 12½

Consequently, when athletic efficient men are required, recruits should not be approved who weigh less than the medium weight of the respective ages. This measure would tend to obviate, perhaps, the most frequent objection which is made to recruits when they join their respective corps, namely, that they are "delicate and feeble." It ought to be recollected, that some individuals do not attain their full stature before they reach twenty-five years of age; whereas in males the maximum weight is not generally attained until about forty years of age.

Within a certain range, men of different heights may be deemed equally efficient, in as far as regards stature. Soldiers who are either what may be called very low in stature, or very tall, are not equally efficient for all the duties of the army as men of a medium height. Tall men are said to be deficient of energy, and comparatively incapable of enduring fatigue. Short men are commonly thicker in their proportions than tall men; consequently, although they are deficient in stature, they may be as heavy, and, as the matter of which they are composed is better distributed, they are thereby rendered more efficient.

"Les anciens empereurs de Rome s'etaient formé une garde d'Helvetiens et de Germains d'une haute taille, car ils avaient remarquer sans doute que ces hommes blonds d'une stature haute et epaisse, etaient, comme on dit, de grosse pate, incapable de trahison de ruse et de conspiration, et au contraire fidèlement attaches à quiconque les prend à sa solde, et leur procure abondamment le boire et le manger. D'ailleurs, cette sorte de prestance et ces larges epaules deploient plus richement l'appareil militaire; elles brillent surtout pour les parades, et imposent aux yeux de la multitude. Neanmoins, il est reconnu que les tailles moyennes ont plus de vivacité, d'energie dans un jour de battaille, et les gros corps de septentrionaux se fondent comme le neige, disaient Cesar et Vegece dans les climats chauds, à la moindre manœuvre militaire."—*Dict. des Sciences Medicales*, Vol. lii. p. 498.

I presume the mean stature of the French infantry, will be about 5 feet 3 or 3½ inches English. It has already been stated, that the mean height of the conscripts belonging to the city of Paris, which were approved, was 5 feet 6½ inches English, but as the separation of the conscripts to the different branches of the service is chiefly regulated by stature, the tall men are apportioned to the cavalry and artillery corps. I should suppose that the mean height of the infantry of the British army may be about 5 feet 7 inches, or 5 feet 7½. This estimation is supported by the following statement:

Statement of the Strength and mean Height of eleven Regiments of local militia.

	Strength.	Average height in inches and 10ths.
Highland Lanark,	633	67.3
2d Edinburgh,	506	68.
Kinross,	210	67.2
Peebles,	224	68.3
2d Fife,	621	67.2
6th Lanark,	379	68.6
2d Argyle,	736	67.7
1st Argyle,	686	67.7
East Stirling,	647	68.
Annan and Eskdale,	493	68.1
Kirkcudbright,	596	68.5
General mean height,		67.9 = 5 f. 7 9-10th in.

It will be recollected that the minimum height of the local militia was 5 feet 4 inches, and that of the infantry of the line has for a number of years not been lower than 5 feet 6, so that in respect to the minimum height, the local militia had a disadvantage.

The mean height of the 68th Regiment, now in the Castle, Edinburgh, is 5 feet 7⅝; but perhaps this corps is a little taller than the medium height of the infantry of the army.

I should suppose that an army whose mean height was about 5 feet 7 or 7½ inches would be more efficient than a body of troops whose mean height was either materially higher or lower. If I am right in my conjecture respecting the average height of the infantry of the French and English armies, the British infantry will be about 3½ or 4 inches taller than the French infantry, and consequently, that the former will be comparatively better able to surmount the fatigue attendant on heavy duties than the latter; and, as M. Benoiston de Chateauneuf justly observes in regard to the duties of soldiers, "Qu'il s'exerce au camp ou à la caserne, en campagne ou dans la garnison, le metier des armes est peniblè et dur. Partout pour le supporter il faut de la vigueur et de la santé." Great and long protracted exertion, whether in marching with a heavy knapsack, or in military exercises, tends to exhaust the frame, by which means disease is induced, and the ratio of mortality is increased. When a body of men are obliged to act simultaneously, any exertion to which they are exposed may be easily executed by the general mass; but commonly a portion of the men endure the fatigue with much difficulty, and the exertion of the whole must therefore be more or less regulated by the least efficient.

Volunteers who enlist at the head quarters of corps or depots are examined by the medical officers in charge of the corps or depot, whose approval is final, in men that enlist in the corps to which he himself belongs. The men that enlist with any of the parties belonging to a recruiting district are examined by the staff-surgeon attached to the district. According to a circular from the Director-General of Hospitals, bearing date 30th July 1830, which was issued with the concurrence of the Secretary at War, the approval of a recruit for the army by a district staff-surgeon is declared to be final. Such is the law, but not so the usage, for when a regimental medical officer disapproves of a recruit that had been approved at the head quarters of a recruiting district by the staff-surgeon, and reports the circumstance to his commanding officer, the staff-surgeon is eventually called upon by the Adjutant-General, and also by the Director-General of Hospitals, to explain the reasons which induced him to approve of the man in question. As the alleged infirm recruit is never remitted to the staff-surgeon for a second examination, and as he can in general have no recollection of the man, all the explanation he usually gives to the respective military and medical authorities, and indeed all the explanation he can give, is to state that on such a day he examined a recruit bearing the alleged name, and signed his attestation, because he thought him in all respects fit for His Majesty's service. In as far as staff-surgeons are concerned regarding the examination of recruits, the penal laws are greatly meliorated. They are not now called upon to refund all the expences which may have been incurred on account of alleged ineligible recruits which they had approved, nor are they by any means so liable to other heavy penalties as formerly.

The lowest ratio of men rejected in the following statement is 13.1 per cent., and the highest is 41.1 per cent. But this report comprehends only the men found unfit by the staff-surgeon

STATEMENT showing the Number of Recruits Examined at the Recruiting Districts for longer and shorter periods, together with the ratio Rejected per cent.

							SCOTLAND.													
	Dublin.		*Cork.*		*Newry.*		*Edinburgh.*		*Glasgow.*		*London.*		*Leeds.*		*Coventry.*		*Bristol.*		*Liverpool.*	
	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.	No. examined.	Ratio per cent. rejected.
1804,	456	21.2																		
1805,	1501	17.8																		
1806,	1781	20.8																		
1807,	1776	21.1																		
1808,	1114	18.3																		
1809,	1423	22.4																		
1810,	1523	19.6																		
1811,	1793	17.4																		
1812,	3320	17.9																		
1813,	2984	15.1																		
1814,	1535	15.7																		
1815,	3413	19.4																		
1816,	2740	26.																		
1817,	1426	30.					661	21.	613	17.4										
1818,	1801	39.5					614	24.1	593	22.5										
1819.	2783	27.4					597	32.7	805	22.3										
1820,	1886	31.2					927	21.3	1138	21.3										
1821,	1986	30.					629	36.	788	27.3										
1822,	3233	29.6					1041	26.5	1122	28.1										
1823.	3100	31.5					866	34.9												
1824,	3558	29.					832	25.2	1270	41.1										
1825.	6229	22.3					1406	14.5	2478	23.9										
1826,	4019	19.2	2300	25.9	1349	16.2	1457	14.2	1545	27.7	3023	14.6	1181	20.3	1471	16.5	706	23.7	2008	13.1
1827,	2588	22.5																		
1828.	1144	25.5	629	23.3	481	13.5	492	25.2	566	29.	1385	30.5	332	14.7	433	16.3	251	15.1	907	20.3

at the head quarters of recruiting districts, and not the men that have been rejected at primary inspection in small towns and villages by medical practitioners. During the years 1825, 1826, 1827, and 1828, I examined at the recruiting depot, Dublin, 8281 town recruits, (primary inspections,) of which number I found 30.8 per cent. unfit for service; and, during the same period, 5668 country recruits, (secondary inspections,) 7.1 per cent. of which were finally rejected by medical boards. The ratio of recruits rejected at my primary inspections was about 6 per cent. lower than the ratio of conscripts exempted from serving in the army, on account of medical objections in the department of the Seine during the two periods included between the years 1800 and 1810, and the years 1816 and 1823; but no very definite conclusion can be drawn from the circumstance with respect to the comparative efficiency and health of the men approved. Every medical officer who may be employed in the duty of examining either recruits or alleged disabled soldiers, must be guided in his decisions by his own discretion, professional skill, and practical acquaintance with the duties and habits of soldiers. Whatever rules and regulations may be issued on the subject must have only a general application, and so far they may be highly useful, for it is impossible to frame specific instructions on a point of duty where sound judgment and experience must be the chief guide. And as the conclusions of individuals from the same premises are occasionally different, so there may be discordant opinions entertained by medical officers respecting recruits, without being a result of culpable inattention by any party.

On a general review of the circumstances connected with the examination of recruits for the British army, and of conscripts for the French army, I think it may be inferred that the recruits for the British army are better selected than the conscripts. One thing is evident, that the duty of the French medical officer is much more arduous and difficult than that of district surgeons attached to recruiting depots. The former have to be especially on their guard against the simulation of disabilities, which is frequently attempted, and sometimes with indomitable perseverance. "Il n'est rien que l'esprit n'invente, la malice ne trouve, et la ruse ne conseille, pour tromper le medecin et lui faire prendre le faux pour le vrai l'apparence pour le realite." The district surgeon is chiefly to be on his guard against approving of a recruit who is infirm, so as to render him unfit for the army. He is comparatively little exposed to be deceived by the trickery of recruits. Occasionally an instance occurs where a man conceals a disability, but this is not frequent. In a circular which was issued from the medical board, bearing date 1st June 1824, medical officers were directed not to approve of men who had certain diseases that are not obvious, or which may be concealed, especially calculus or stricture; but as the non-existence of these disabilities could be ascertained only by the uniform use of instruments, I confess that I saw serious objections to the practice of invariably employing such means of examination in the case of persons voluntarily entering the service.

If I am rightly informed, the ratio of recruits rejected in some recruiting districts has increased lately to even as high a ratio as from 45 to 55 per cent. in the primary inspection, (town recruits,) and from 10 to 30 per cent. in the secondary inspections (country recruits.) Are we to attribute this circumstance to the same cause which is supposed to have led to an increased ratio of rejected conscripts, namely, a deterioration of the race, or to greater solicitude and caution on the part of the examinators?

There are several other circumstances connected with the French army, such as the diet, exercise, and lodgings of the men, and the severity and frequency of punishments, which may contribute to diminish the chances of life, and thereby render the ratio of mortality higher than in the British army. To discuss these topics in this paper would, however, extend it to much too great a length.

The influence of the melioration of the condition of soldiers in reducing the ratio of mortality is satisfactorily exhibited by the numerical statements at the commencement of this article. I should wish much to see the advantages which have resulted from an increased attention to the wants, the comforts, and other means of preserving the health of soldiers of the British army at home and abroad, and the improvements which have taken place during a period of fifty or sixty years in the administration of the different departments of the army similarly illustrated. I have little doubt but a diminished ratio of mortality would indicate the progressive influence of the numerous and important improvements to which I have alluded. Statistical documents would exhibit the beneficial consequences of these wise, humane, and liberal measures, in a light and with a force which could not be done so effectually by any other means.

The medical world is under great obligations to Dr Burke, Inspector-General of Hospitals, for his valuable observations on the mortality among his Majesty's troops in India, from 1826 to 1832, published in the last number of the Edinburgh Medical and Surgical Journal. He has set an excellent example to the principal medical officers in other foreign stations, which I sincerely hope will be universally imitated. It is of much importance in compiling materials for deducing the annual ratio of mortality which occurs among a body of troops, that the strength (numbers) and the deaths should be carefully and accurately stated, whether the deaths took place in hospital or not, and from whatever causes. The column headed "number treated" in returns of sick possesses little interest; the mean ratio of sick in hospital would be of much more importance. When a patient in hospital is attacked with a new and apparently more serious disease, he should be discharged on the books, and readmitted under the head of the new disease. Unless this circumstance be attended to, some diseases, such as venereal, rheumatism, and dyspepsia, may appear to be more frequently fatal than is really the case.

I entertain very sanguine hopes that the Statistical Society will soon collect and publish some highly valuable information in regard to the medical statistics of different classes of society. Hitherto little attention has been paid to this branch of study in this country. By condensing, arranging, and publishing some of the statistical details that may be accessible to the members of the Society, they will confer a great favour on the public, of which it is impossible to anticipate all the practical and beneficial results.

ART. IV.—*Remarks on the risk incurred, of Laceration of the Uterus, in Labours complicated with Deformity or Narrowness of the Inlet of the Pelvis.* By JOHN ROBERTON, Esq. Surgeon to the Manchester Lying-in-Hospital.

WHEN labour is retarded, owing to disproportion between the superior aperture of the pelvis and the fœtal head, a most difficult question presents itself to the mind of the accoucheur, viz. "How long may I, with safety to the mother, leave the event to nature?" That he may be in a condition to solve this query, it is necessary he should know, *firstly*, the source and the signs of danger; and *secondly*, what experience warrants in regard to the management of such cases. In touching on these topics, the reader will please to understand that I mean to avoid the ground long since occupied and cultivated with so great ability and marvellous industry by my venerable and respected colleague, Dr Hull, in his "Letters to Simmons," particularly his "Second Letter." I allude to such interesting points as these: What degrees of deformity require the Cæsarean section? What lesser degrees call for *embryulcia?* And again, what other degrees of deformity admit of delivery by the vectis or forceps, or, in rarer instances, of the labour terminating by the unaided efforts of nature? These are subjects of inquiry which Dr Hull may be said in a great measure to have exhausted,—at least until we have discovered new mechanical means applicable to obstetric difficulties: And the accoucheur, who is desirous of full information regarding the most difficult points of practical midwifery, will not fail to study the "Letters to Simmons," together with the same writer's Appendix to a Translation of Baudelocque's Memoirs on the Cæsarean Section. Excluding, therefore, matters so amply and so well discussed, I confine my remarks to the narrow field I have prescribed for myself in the heading of this paper; in pursuance whereof I proceed to detail briefly a series of cases, with the view of showing the risk, speedily incurred, of rupture of the uterus, when the inlet does not readily admit the descent of the fœtal head.*

Case I.—The outline of this case I am obliged to give from memory, not having made notes at the time; but the circumstances are so vividly impressed on my recollection, that the general accuracy of what follows may be depended on. All the other remaining cases are transcribed from notes. In May 1827, I was desired by one of the hospital midwives to see a woman in tedious labour residing in Preston Street, George's Road. The head I found presenting naturally, but not engaged in the inlet. The membranes had ruptured, and the *os uteri* was dilated. The midwife, although she had not been very many hours in attendance, was induced to send for me, on account of the peculiar character of the labour; the patient tossing about in bed, and complaining greatly of the crampy severity of the pains. This was at midnight. I merely recommended patience, and returned home.

Early in the morning I was again summoned, and arrived about six o'clock. The pains in the belly had been excruciating, but were now ceased; the skin was cold and clammy, and the woman frequently vomited; the head was lower in the upper aperture than at my first visit. I remember it struck me that here the *uterus* was either ruptured or about to give way. I therefore sent for my then senior colleague, Mr Radford, who arrived soon after eight, and judged that rupture had taken place. As the head had not receded, we agreed to employ the long forceps first of all; without unusual difficulty they were applied, but the head could not be brought into the cavity of the pelvis. These being withdrawn, I perforated the head, and effected delivery in the usual way. Mr Radford, in removing the placenta, satisfied himself that the *uterus* was extensively ruptured. The patient died on the third day.

The body was inspected in the presence of, among others,

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* It is needful the reader of this paper should bear in his recollection that my aim is not to treat of laceration of the *uterus* in all its variety and extent, but merely of this accident as produced by *one set* of causes.

Messrs Fawdington and Radford, when it was found that the uterus was ruptured on the left side (I believe) posteriorly; and that the promontory of the sacrum projected, so as somewhat to diminish the antero-posterior diameter of the pelvis. The period from the commencement of labour to the occurrence of rupture was short of *twelve hours.*

Case II.—October 31, 1829.—Mary Kemp, Fletcher Street, a patient of the Lying-in-Hospital, tall, apparently healthy and vigorous, about 30 years of age, and has had six children. The midwife (Mrs Buckly) states, that the patient's previous labours were tedious and difficult; but I could not learn that she had ever been assisted by instruments. The children were born alive. This morning I find the *os uteri* dilated, the membranes ruptured, and the head presenting naturally at the brim, but without having in the least entered the inlet. The most notable circumstance was the state of the anterior lip of the womb, which was remarkably œdematous and enlarged. At first I took it for the bladder prolapsed, but on introducing the catheter I found how the matter was. The belly was very prominent, and somewhat pendulous. This condition of the labour the midwife assured me had existed for eighteen hours. The pains had all along been trifling.

At 10 o'clock in the evening, on making a careful examination, along with Mr Radford, whom I called into consultation, we found that the conjugate diameter of the inlet was little, if at all, more than three inches. There was no fever, neither were the parts hot; yet the patient had frequent vomiting. Her pains now were crampy and very severe; she tossed about, and was restless and impatient. The head did not in the least advance. The infiltrated tumid state of the *cervix uteri* deterred us from applying the long forceps. At midnight, fearing rupture of the *uterus*, if delivery was longer delayed, we agreed to perforate the head. In about two hours the delivery was effected by means of the craniotomy forceps. On making a careful examination after the birth, the *cervix uteri* was found ruptured posteriorly from two to three inches in extent,—the rent not (so we imagined) penetrating the peritoneal coat. This patient recovered. The duration of labour was about *thirty-five hours.*

Case III.—Jane Cunningham, æt. 30, thin and very delicate, in labour of her second child. Says her first labour was tedious, but terminated without instrumental aid. January 5, 1831.—Mrs Hall, midwife, visited her at 7 a. m., when the membranes were found entire, and the *os uteri* dilating kindly. During the day the pains were not severe, and the labour advanced but slowly. About 7 p. m., when the head rested on the perineum, the patient began to complain of severe pain at the lower part of the belly, followed by vomiting and sinking; suffice it to say, that she was delivered by means of the perforator at 1 o'clock A. M., by my friend and colleague Mr Fawdington, whose patient she was. Rupture of the uterus had evidently taken place; and the patient was, at the time of delivery, in a hopeless condition. The uterus did not contract well, and there was considerable flooding. In a few hours death took place.

On inspection of the body, it was found that the rent in the *uterus* extended from the vagina through the back part of the *cervix*, and for some length through the body of the *uterus*. The promontory of the sacrum encroached in a slight degree on the conjugate diameter of the inlet. From the commencement of labour till the uterus gave way *thirteen hours* elapsed.

CASE IV.—Nancy Geary, æt. 37, tenth child. I was present at the *post mortem* inspection of this case. The nature of the labour I learnt from Mr Clough, whose patient she was.

Nov. 9, 1832, at 3 A. M., was seen by Mr Clough, being reported by the midwife as in tedious labour. The funis was in the vagina; the *os uteri* dilated, and the head beginning to fill the cavity of the pelvis. At 9 o'clock, *i. e.* six hours after being seen by Mr Clough, the patient died suddenly and unaccountably.

Inspection.—The left side of the *uterus*, somewhat anteriorly, presented an immense ecchymosis, in one part of which there was an opening into the uterine cavity of about two inches, and through this the bag of membranes (and within the bag a foot of the fœtus) protruded. On enlarging the opening, it was discovered that the substance of the *uterus* had given way to a considerable extent, and that a part of the fœtus lay in the rent covered merely by the membranes and the peritoneal coat of the *uterus*. The rupture had extended in part through the placenta; and several pounds of blood had escaped, and lay under the peritoneum in the left *iliac fossa*. The fœtal head was rather firmly impacted in the cavity of the pelvis, the vertex just beginning to turn under the arch of the pubis. On withdrawing the head, the funis, which was very thick, was found prolapsed, the fold lying in the conjugate diameter of the brim, on the left side of the *symphysis pubis*, and, by pressure, had caused an indentation on the side of the fœtal head. Inside of the *symphysis pubis*, just at the junction there was an exostosis about the size of a large bean, the smallest diameter of which projected into the pelvis. The antero-posterior diameter of the brim was $3\frac{3}{4}$ inches. Transverse diameter, $5\frac{1}{2}$ inches. The child, a well-formed male, weighed $9\frac{3}{4}$ pounds Avoirdupois. The duration of the labour previous to the rupture was about *twelve hours*.

CASE V.—Mary Whitaker, aged 35, at the full time of her eighth pregnancy. Many of her labours have been hard. Between 2 and 3 o'clock A. M., July 6, 1832, labour commenced. At 4, Mrs Langtree, midwife, saw her, and states that the *os uteri* was undilated, and that the labour-pains were slight. By 7 the pains had become very severe. Between 8 and 9 rupture of the uterus, it would seem, took place. A little before this occurrence the midwife sent for me; but, owing to my absence from town, my senior pupil, Mr Mathias, got my colleague, Mr Stephens, to visit the patient. Mr Stephens arrived about half-past 10, and found the usual symptoms of rupture of the uterus. There had been discharge of blood from the vagina; and there was extreme tenderness of the belly, also a sense of sinking, hurried breathing, &c.

With the advice and assistance of two of his colleagues, Mr Radford and Mr Hunt, the patient was with difficulty delivered by turning; both the fœtus and the placenta having escaped through a rent in the *uterus* into the abdomen. The rent was in the left side somewhat posteriorly. The brim, they agreed in thinking, was manifestly under the standard dimensions.* From the commencement of labour till the occurrence of the rupture, the interval was *six hours*.

CASE VI.—Jane Casey, aged 28, at the full time of her sixth child,—the last four were dead born, and one was a forceps case. January 12, 1833.—There was no labour at breakfast time, but soon after there were slight pains, and the membranes ruptured at 11 o'clock A. M. In about half an hour, Mrs Hall, midwife, saw her, and, finding the funis and hand present, requested my assistance. Being engaged elsewhere, I did not arrive till half-past 3 P. M. when I found the funis no longer pulsated, the hand was at the *os externum*, and the head presented naturally at the brim. In making my examination, my finger easily reached the promontory of the sacrum, which encroached on the antero-posterior diameter by at least half an inch. The pubis was natural in form, and the transverse diameter undiminished.

It was clear, that, since the fœtus was dead, the head ought to be opened, and this I determined to return and do as soon as the pains should fix the head in the brim, for there had as yet been no pains worth naming. On leaving, I cautioned the patient against getting out of bed or tossing about. The midwife reports, that in about an hour after, that is, at half-past four, a pain taking her, she suddenly raised herself in bed, sprung upon her knees, and uttered a loud scream; that immediately, blood issued from the vagina, and she began to vomit, became cold, pallid, and her looks sunk. Meanwhile, being at another labour, I did not visit her again till 8 o'clock, three hours and a half after the accident, when I found her death-like, and nearly pulseless.

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* The above outline (sufficient for my purpose) Mr Stephens has kindly furnished me. An ample history of the case will, I hope, be given to the public by that gentleman, as it was one of much interest, the patient having ultimately recovered; and now (May 1834) she is again pregnant.

On laying the hand on the abdomen, the body of the child could be felt, a prominent ridge, under the parietes. Pressure on the fœtal head with the point of the perforator, caused it to retreat from the inlet. Finding it would not be easy to perforate the head, I brought down the feet. In effecting this, it seemed to me that the uterus was ruptured in the left side, somewhat posteriorly, from the cervix to the fundus. The body of the fœtus was with slight difficulty drawn through the inlet, but the head not without a great deal. After some ado, I completed the delivery. On the second day the patient died. An examination of the body was prevented, after it had been promised, by an Irish row, the woman's husband being from Ireland, and little better than a barbarian. Duration of labour previous to the occurrence of the rupture, *six hours.*

Case VII.—February 12, 1833, 8 o'clock a. m. Abbot, æt. 44, at the full period of her fifth child. The four preceding births had been difficult, but instruments had not been employed; and all the children were alive. Yesterday, at 11 forenoon, the labour commenced, and made little progress. At 8 p. m. the membranes ruptured, but it was not till 11 that her midwife reached her, at which time the pains were strong, and the *os uteri* dilated to about the size of half-a-crown. At 4 in the morning, as the pains caused great suffering, the midwife sent for the surgeon of the week and district, and he being from home, I was sent for at seven o'clock. I arrived in an hour, and I found the apothecary of the Hospital had been with her a couple of hours. It appeared, that a little before his arrival at 6 o'clock, the patient had had violent cramp in the belly, which made her scream, when immediately she began vomiting, and the pains left her. At that period the *os uteri* was not fully dilated.

At the present hour (8 o'clock) I find the woman pale, casting out mouthfuls of fluid on the bed, and complaining of her belly, which is prominent and tender to the touch. On examining, I find the vertex presents at the inlet, that the head recedes on the slightest touch, and that on withdrawing my hand it is smeared with blood. The promontory of the sacrum evidently advances, probably half an inch or more, on the antero-posterior diameter of the brim; and there appear to be two hard bony points projecting from the inner surface of the pubis. I determined on turning; and, in the act of seizing the feet, was sensible that the whole, or nearly the whole, of the fœtal body lay without the uterus. The head I could not bring through the brim until I had perforated in the right limb of the lambdoidal suture, and fixed the blunt hook in the *foramen magnum*. The placenta lay detached in the abdomen. A considerable quantity of blood also lay in the same cavity. In withdrawing the placenta, I felt the *fundus uteri* contracted, and it contracted further on my pressing against it with the tips of my fingers.

During thirty-six hours this poor woman seemed as if little ailed her. The skin and the pulse were so good, that my colleagues who saw her could hardly believe rupture of the uterus had occurred. On the morning of the third day she died.

Inspection of body, sixteen hours after death.—A large coagulum occupied the pubic region, and a thin layer of blood extended all over the bowels. Under the coagulum was the rent which extended (in the form of a crescent, the convexity downwards) from the right side of the *cervix uteri* across to the left, the rupture on the left side extending with a sweep upwards into the body of the viscus. The lowest part of the rent passed so near the vagina as just to leave a small rim of the *os uteri* untouched. The bladder was laid open transversely, the tearing of the uterus having extended through the coats of the bladder. The conjugate diameter of the brim measured exactly 3⅞ inches; the transverse diameter 4½ inches. At the junction of the *ossa pubis* there was a ridge of bone, the thickness of a quill, contributing to the tightness of the brim.

The length of time till the occurrence of rupture amounted to *nineteen hours*.

Case VIII.—This case I saw once only when summoned for that purpose to a general consultation of the officers of the hospital. The following brief outline will suffice. May 30, 1833. An hospital patient, æt. 29, three years ago, had a live full-grown child; and twelve months since a full-grown child born dead, but without particular difficulty. Says that on one occasion she had to be delivered with instruments. At eleven o'clock last night had symptoms of labour, when she sent for her midwife. At about half-past nine o'clock A. M. rupture of the uterus took place. In between two and three hours the child was delivered. The rent was in the right side of the uterus anteriorly, and the brim was supposed to be narrow. The duration of labour till rupture took place was *ten hours*.

Case IX.—Nov. 26, 1833, 10 o'clock A. M. Mrs Cooper, æt. 28. (Some particulars of this case were given in the 119th Number of this Journal, page 401, as illustrative of the cure of *prolapsus vesicæ*.) I shall, therefore, only enumerate very briefly those circumstances which have reference to the present subject.

The membranes ruptured forty hours before I saw her. On making an examination it was clear that the promontory of the sacrum, in some degree, encroached on the antero-posterior diameter of the inlet. The vertex might be felt towards the left groin. The scalp swollen and infiltrated, with a small proportion of the bulging part of the head, was squeezed through the brim into the pelvic cavity; and, flattening from the pressure between the pubis and promontory, the tumour filled the inlet from side to side. The bladder also, prolapsed, barred the upper half of the vagina. The pains were incessant, and the appearance of the countenance indicated extreme suffering. The tongue was coated, the thirst urgent, and the lower abdomen tender; particularly on the right side, just above the brim of the pelvis. The pulse, however, was under 100, and there had been no vomiting. The case appeared likely to terminate in rupture of the uterus, if delivery were not speedily accomplished.

On further examining, we detected a fold of the funis in the vagina pulseless and flabby. This relieved us from all scruples about the life of the child. The perforator was employed, the brain removed, and, by the help of the craniotomy forceps and the uterine efforts, the base of the skull was, with some difficulty, drawn into the pelvis, and the delivery finished. After a few minutes the placenta was naturally expelled. I now gently, but carefully, examined the state of the inlet, by introducing my hand into the vagina; when I became aware, as soon as my finger touched the promontory of the sacrum, that the *cervix uteri* had been ruptured in that quarter. The rent was in diameter, from top to bottom, about two inches; and opened transversely nearly as much; it appeared to extend through the substance and peritoneal coat of the uterus, laying bare the sacro-vertebral angle. I am inclined to think the conjugate diameter of the brim could not be more than three inches.

By the use of opium in the outset, complete repose, warm poultices to the abdomen, and afterwards purging by calomel and castor oil, the tenderness of the abdomen and the fever, which on the third day after labour were considerable, gradually subsided; and at the end of a month the patient was able to leave her bed at intervals. By the eighth week she was doing for her family.

The first inference I would draw from these cases is one of much practical importance,—that when rupture of the uterus does happen from contracted inlet, the interval, from the earliest signs of labour to the occurrence of the accident is seldom great. The nine instances I have detailed give intervals as follows: Case 1st, interval not more than twelve hours; 2d, about thirty-five hours; 3d, thirteen hours; 4th, twelve hours; 5th, seven hours; 6th, six hours; 7th, nineteen hours, from the first signs of labour, and ten hours from the escape of the waters; 8th, ten hours; 9th, forty hours.

Nine cases, however, I grant, afford insufficient data to warrant a practical conclusion deserving the assent of the experienced accoucheur. I have, therefore, collected a number of cases of ruptured uterus to be found in English works of credit; especially those, the details of which are given with the requisite degree of minuteness; and in which it is stated, or left to be inferred, that the labour was impeded by a degree of deformity of the brim of the pelvis.

CASE X.—Breech presentation; rupture of uterus occurred in twelve hours; rent in the cervix in front; projection of sacrum angular and sharp; "the internal superior ridge of the *os-pubis* and *ilia* resembling the edge of an ivory folder."—*Gartshore, London Med. Journ.* Vol. viii. p. 376.

CASE XI.—Fourth labour, rupture took place in eight hours; rent in posterior part of uterus; "pelvis narrow," child of a monstrous size.—*Hooper, Mem. of the Med. Society,* Vol. ii. p. 118.

CASE XII.—Third labour; rupture occurred in twenty-one hours; rent in the left side of uterus anteriorly; pelvis faulty by "a projection of bone, or an exostosis situated a little to the left side of the *symphysis pubis*;" it was sharp pointed, diminishing the conjugate diameter by about half an inch.—*Essays on various subjects, &c. by Dr Dewees,* p. 73.

CASE XIII.—Fourth labour; rupture occurred in about eight hours; rent in the left side of the uterus; brim of pelvis greatly deformed.—*Hamilton's case quoted by Hull, First Letter,* p. 217.

CASE XIV.—Seventh labour; thirty hours till occurrence of rupture; which was situated posteriorly; delivery was effected with difficulty, "in consequence of some deformity in the bones of the pelvis."—*M'Keever on Lacerations of the Uterus, &c.* p. 18.

CASE XV.—Second labour; thirty hours till occurrence of rupture, which was in the posterior part of uterus; "deficiency of room in the cavity of the pelvis."—*Ibid.* p. 41.

CASE XVI.—Third labour; thirteen hours till rupture took place; which was in posterior part of uterus; promontory of sacrum "formed with the last lumbar vertebræ a very acute well-defined angle."—*Ibid.* p. 77.

CASE XVII.—Seventh labour; fifteen hours till rupture (vaguely stated;) the rent extended all round the cervix, except a small shred on the left side; conjugate diameter 3½ inches.—*Ibid.* p. 80.

CASE XVIII.—Fifth labour; "a very few hours" till occurrence of rupture, suppose twelve; child's head could not be brought through the pelvis (which was malformed) without perforation behind the ear.—*Doubleday, Med. Gazette,* Vol. iii. p. 32.

Case XIX.—Eleventh labour; twenty-two hours till rupture; which was in left side of the uterus; had, on several former occasions, to be delivered with instruments, owing to "a contracted state of the pelvis."—*Spackman, Med. Gazette,* Vol. v. p. 522.

Case XX.—A midwife, we are told, was called in the evening, and that rupture occurred at five o'clock the following morning, suppose after twelve hours labour; laceration in right side of uterus; pelvis of "contracted dimensions."—*M'Intyre, Med. Gazette,* Vol. vii. p. 9.

Case XXI.—Fifth labour; probably not more than three or four hours elapsed till rupture took place, which was in the "right side" of the womb; fœtal head "firmly impacted in the pelvis."—*Smith, Med. Gazette,* Vol. viii. p. 304.

Case XXII.—Sixteen hours till rupture occurred, which was in the fore part of uterus.—*Ramsbotham, Med. and Physical Journal,* Vol. xxx. p. 360.

Case XXIII.—Third labour; laceration occurred in about ten hours, which was in the posterior part of womb: pelvis bad, sacrum prominent.—*Ramsbotham's Cases, Part* i. p. 389.

Case XXIV.—Fourth labour; about ten hours till laceration happened; pelvis very bad.—*Ibid.* p. 394.

Case XXV.—Rupture took place in about eight hours; state of pelvis not mentioned.*—*Ibid.* p. 397.

Case XXVI.—Seventh labour; thirty-two hours till rupture occurred, which was in fore part of the womb; pelvis deformed at the brim.—*Ibid.* p. 400.

Case XXVII.—Second labour; eleven hours till uterus ruptured; laceration situated posteriorly; conjugate diameter 2½ inches, the promontory of sacrum presenting a sharp ridge.—*Ibid.* p. 403.

Case XXVIII.—Second labour; in about twenty hours rupture took place, which was in the posterior part of vagina; conjugate diameter 3 inches.—*Ibid.* p. 411.

Case XXIX.—Sixteenth labour; labour "not of many hours' duration;" I shall suppose eight; laceration in front; pelvis somewhat confined.—*Ibid.* Part ii. p. 484.

Case XXX.—Rupture took place in about eight hours; brim diminished by projection of sacrum.—*Ibid.* p. 492.

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* Here the pelvis, although not said to be contracted, I suppose to have been so. For I find Dr Ramsbottom remarks (in Part i. p. 385,) that in all instances of ruptured uterus, "there is a narrowness, if not an absolute deformity of the pelvis."

Case XXXI.—Third labour; about seven hours elapsed till laceration occurred; pelvis contracted at the brim.—*Ibid.* p. 498.

Case XXXII.—First labour; in about twenty-four hours rupture took place; its situation on the right side of the uterus; brim contracted.—*Powell, Med. Ch. Trans.* Vol. xii. p. 537.

Case XXXIII.—Third labour; fifteen hours elapsed till laceration took place, which was in the uterus posteriorly; conjugate diameter contracted.—*Birch, Med. Ch. Trans.* vol. xiii. p. 357.

Case XXXIV.—Fourth labour; rupture took place in eleven hours; its situation in the womb in front; brim contracted.—*Ibid.* p. 360.

Case XXXV.—Second labour; in about seventeen hours rupture (it would seem) took place; its situation, the anterior part of uterus; the pelvis preternaturally small, but not distorted.—*Clough, Med. Repos.* Vol. iii. p. 89.

Case XXXVI.—Fourth labour; rupture after about four hours of actual labour; its situation the anterior part of uterus; sacrum projected; conjugate diameter three inches.—*Holmestead, Med. Repos. for* 1824, p. 209.

These twenty-seven cases, together with the preceding nine, in all thirty-six, warrant the following deductions.

First, the duration of labour previous to the occurrence of laceration was

in 2 cases	4	hours	in 1 case	17	hours
1 do.	6	do.	1 do.	19	do.
2 do.	7	do.	1 do.	20	do.
5 do.	8	do.	1 do.	21	do.
3 do.	10	do.	1 do.	22	do.
2 do.	11	do.	1 do.	24	do.
5 do.	12	do.	2 do.	30	do.
2 do.	13	do.	1 do.	32	do.
2 do.	15	do.	1 do.	35	do.
1 do.	16	do.	1 do.	40	do.

In the major proportion, therefore, this period was under 13 hours. The duration of labour, too, it ought to be remembered, is calculated pretty nearly from the occurrence of the earliest signs of parturition in all the cases, and not from the commencement of active labour pains; otherwise its average duration would have been scarcely half what it appears in the table. This is a highly valuable fact of a practical kind. *

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* Dr M'Keever, in his very interesting treatise on "Lacerations of the Uterus and Vagina" p. 7, speaks of the accident as occurring when the patient has encountered "for many hours, perhaps for days together, sufferings of the most acute and harassing description." His own statement, however, in reference to the number of hours each of seventeen patients (who suffered rupture of the uterus in the

Second, In only twenty-nine of the cases is the number of the labour given. In

1	case it was the	1st	labour.
5	do.	2d	do.
6	do.	3d	do.
5	do.	4th	do.
3	do.	5th	do.
1	do.	6th	do.
4	do.	7th	do.
1	do.	8th	do.
1	do.	10th	do.
1	do.	11th	do.
1	do.	16th	do.

Hence we see that laceration rarely occurs in a first labour, and oftenest, perhaps, in a second, third, fourth, and fifth. At all events, it would seem that those who are fruitful mothers, as shown by a high number of births, are comparatively less exposed to this fearful accident than those earlier in the career, or lower in the scale of fecundity.

Third, The *uterus* (in the cervix) seems to give way with nearly equal readiness in all parts of its circumference. In thirty-one cases the situation of the rent is mentioned: *

In	1,	cervix separated from vagina except by a shred.		
	8,	laceration,		anterior.
	11,	do.	-	posterior.
	5,	do.	-	lateral.
	3,	do.	-	antero-lateral.
	3,	do.	-	postero-lateral.

Fourth, What kind and degree of deformity or tightness of the inlet of the pelvis is the most likely to cause laceration of the *uterus*, cannot, perhaps, be gathered from the foregoing cases. It would seem to be enough for the production of the accident, that the inlet is too contracted, easily to admit the descent of the fœtal head, or the breech (should that be the presenting part.) In a great majority of instances of slight contraction of the inlet, in perhaps three cases out of four, the diminution of space

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Dublin Lying-in-Hospital) was in labour before the occurrence of the accident, does not support the remark. Three were in labour twelve hours; three twenty-four hours; nine thirty-six hours; and two were forty-eight hours. These results by no means contradict those I have given above; for in some of Dr M'Keever's patients, the uterus had ruptured before they were brought into the hospital, while others were admitted after having suffered severely from previous mismanagement. Besides, it does not appear in how many of the cases faultiness of the pelvis had to do with the production of the accident.

* In every instance of laceration of the uterus I have seen the rent has always, through whatever other parts it may have passed, divided in some direction the cervix.

is caused by the promontory of the sacrum encroaching on the antero-posterior diameter. On this ground, perhaps, we may explain why, in a somewhat greater number of cases of laceration, the rent is found in the posterior, rather than in the anterior, part of the uterus. And the cause next in frequency is one or more projections of bone springing from the inner surface of the *ossa pubis* at the symphysis. In all cases of difficult labour, therefore, wherein we are led to examine the condition of the brim in order to determine the nature of the obstruction, when we are satisfied that the sacro-vertebral angle does not project unnaturally, we ought to direct the finger to the inner surface of the pubis, both to discover if the symphysis is well-formed, and also whether there is any bony growth projecting into the pelvis; nor ought the hand to be withdrawn till we have ascertained the figure and dimensions of the brim in its other obstetric diameters. A few practical observations will speedily exhaust what I have further to say.

Signs of Danger.—In the practice of a lying-in charity the accoucheur is rarely present with the patient when rupture of the *uterus* happens. Such, at least, has been the case in my own experience. On this account it becomes me to speak with some hesitation respecting the symptoms which portend the accident. From what I have observed, however, and learned from others, I incline to believe that a crampy pain, and tenderness on pressure, in some particular part of the lower abdomen, precede for a time laceration of the uterus occurring under the circumstances I am now supposing, *i. e.* from deformity or tightness of the inlet. There is no mystery in the accident more than in the rending of a piece of cloth when it is overstretched. The rent of the uterus, how far soever it may extend in any direction, is always found in its commencement or in its course in or near that part of the viscus which in labour is necessarily jammed between the fœtal head and the edge of the contracted inlet. Hence, as the uterus in its efforts to force the child into the pelvis, acts by shortening itself, the cervix is, in some part of its circumference, a fixed point, (being held as in a vice, during a pain, between the head and the brim,) and after a few pains, more or less in number, tears at, or near, this fixed point,—the rent extending more or less according to the force of the pains,—the figure of the ledge against which the uterus is jammed,—the strength of the viscus itself,—and, perhaps, other circumstances which are unknown to us. From this explanation, the inference might seem warranted that the rent will be always in the neighbourhood of that part of the brim which is faulty; but a moment's consideration will banish this notion. Undue prominence of the sacro-vertebral angle, were this true, would, as a matter of course, cause the rent to take place in the posterior wall of the uterus, which is far from being always the case. In this species of deformity, the fœtal head necessarily is canted forward on the top of the pubis, or rather on the anterior half of the brim; and should this portion of the brim be sharp, contracted, or otherwise mis-shapen, the laceration will probably occur in the uterus in front, or somewhat laterally. That part of the cervix which is at once *the most firmly jammed and nearest the centre of uterine action*, (which I take to be the centre of the fundus,) will, *cæteris paribus*, the soonest lacerate. But what causes the *crampy pain?* I will explain this by mentioning some particulars of a case which occurred to me about two months ago.

A healthy and patient woman, in the middle class of life, fell in labour, the first time, in her fortieth year. The *os uteri* dilated kindly with the membranes entire. About 11 o'clock P. M., the vertex presented naturally in the brim, which was of course lined with the *cervix uteri*. The pains soon increased in strength and frequency, yet not the head but the scalp tumour descended. There were no signs of pelvic deformity. From two till four o'clock, I watched my patient with great anxiety, owing to an almost intolerable *crampy pain* in the abdomen, a little to the right of the pubis. This pain, never quite absent, was increased on every recurrence of the labour-pains. Finding the anterior lip of the womb tumid, and considerably lower than the head, I began, in the intervals of the pains, to raise it assiduously with the middle finger of my left hand. After some time, I succeeded in raising the anterior portion of the cervix above the brim, when the crampy pain gradually ceased to be complained of; and the labour-pains becoming more efficient, the head was fairly lodged in the cavity of the pelvis by six o'clock. In this case, the brim, although I believe well-formed, was small, and the fœtal head large. The child was a large male. The symptoms, in my opinion, threatened laceration of the uterus, until they were allayed by my removing the cervix from the vice-like gripe in which it was held between the head and the brim.

The symptoms sometimes enumerated in books as indicating the approach of rupture of the uterus may, except *that* I have just-mentioned, be witnessed at times in tedious labour, when there is no particular reason to anticipate any serious accident.

Practice to be adopted.—I speak not of the management of a case after the uterus has given way. This is foreign to my purpose. It is of the means to be adopted when we discover that the head does not pass through the brim, owing to want of space, that I design to speak. And as so much has been written ably and clearly on this very subject, particularly by Hull, Dewees, Ramsbotham, and M'Keever, my remarks need be few;

but they shall be to the point, and such as are suggested to my mind by the foregoing cases and deductions.

It is a sound observation of Ramsbotham, that "one uterus sometimes makes the strongest expulsive efforts for a great length of time, and bears them with impunity; whilst another uterus undergoes a breach in its structure under less active, and under apparently far more trifling exertions." We cannot, unfortunately, predict of a given case what degree of compression, in a narrow inlet, the uterus will endure without danger. And since, when rupture actually takes place, the mischief is so dreadful, we are not warranted in trying an experiment as to what the uterus will safely bear. Whenever the head is retained above, or firmly locked in, the inlet, after labour is begun, I conceive that the accoucheur is bound to regard the case as one of *imminent danger* to the mother. It is true no mischief may occur for many hours, or even days. The scalp may be pushed, in the form of a cone, low into the pelvis; the bulging part of the head may be wonderfully flattened; and the lips of the uterus may hang in the vagina in large tumid lobes; (all this I have witnessed) and yet the parent and child shall escape injury.* But such instances are no rule. They warn us, it is true, against rash interference, against stepping in to the help of nature without the most anxious, sedulous, yet calm deliberation. But they ought to influence our practice even less than instances of a diametrically opposite kind,—where rupture of the uterus happens in four, six, or eight hours after the first signs of labour. For surely the life of the parent is the first object of consideration. Even her life, doubtless, may justifiably be put in some hazard to afford the fœtus a chance of life (how far, is indeed a difficult problem;)—but whenever the life of the mother and that of the fœtus are poised in opposite scales, no one can hesitate which ought to preponderate, especially, too, since in the case I am supposing, the death of the parent, or rupture of the uterus, (which is nearly, at least in a practical view, the same thing,) occasions the death of her offspring. The data I have furnished appear to me to warrant the following practical rules.

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* I am deeply anxious lest any thing I advance in this paper should cause the junior practitioner too much to distrust the powers of nature, and lead him oftener than he ought to employ instruments. If such an impression is made, the fault, I trust, will be his, not mine. Although it be true that when rupture of the uterus actually happens, owing to deformity or narrowness of the pelvis, it generally takes place in no long time after the commencement of labour, I by no means wish it to be inferred that rupture must inevitably occur sooner or later in labour thus complicated, even after days of continual effort. I am convinced that, in some cases of this kind, the patient would die undelivered, from the effects of inflammation, or (ultimately) from exhaustion, without the occurrence of this accident. In Hull's tables of successful cases of Cæsarean births, I observe it is stated that some of the patients were two, three, four, five, and even seven days in labour before the operation was performed. My object is to bring forward certain facts, in order that the accoucheur may not be ignorant of the danger that portends, not to magnify the danger above what is warranted.

1. That as in a majority of those instances of rupture of the uterus, caused by faultiness in the brim, the accident occurs within twelve hours after labour has commenced, the practitioner ought, in every case of labour involving this impediment, to solicit a consultation. Whatever be the amount of his experience, he is not at liberty to rely solely on his own judgment, if a second opinion can be obtained.

2. Is there space to admit the passage of the head, allowing for moderate compression and moulding? If this is determined in the affirmative, (I say nothing of the facts on which such determination ought to be founded; they are to be seen in the works of Burns and Dewees,) then the progress of the labour is to be patiently, but most attentively watched. If in the negative; there can be no use in much delay, embryulcia ought to be had recourse to. Moreover, when we have *satisfactory* proof that the fœtus is dead, the head ought to be forthwith perforated, even although we conceive that it might be born by the natural pains; for surely nothing is more absurd than that the uterus of a living woman should be *in any degree* bruised, or its integrity endangered, to preserve the integrity of a dead fœtus. *

3. When it is determined to watch the efforts of nature, the state of the *os uteri* demands particular attention. Blood-letting, if there be the kind of rigidity in which this remedy is useful, should be performed, not forgetting, however, that, if the deformity is owing to *Malacosteon*, the constitution ill bears the loss of blood. Unless there be entire absence of labour-pains the patient is to lie perfectly still in bed, either on her side or back; if on the former, which is commonly the easier position, the obliquity of the uterus generally requires that the abdomen be supported by a broad flannel binder. Where there are labour-pains, and the *os uteri* is becoming tumid from compression, we may,

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* One *satisfactory* proof of the death of the child is furnished by the funis being prolapsed and pulseless. The stethoscope will no doubt enable us ultimately to triumph over the important obstetric difficulty,—as to whether the child, *in utero*, in tedious and difficult labour, is living or dead,—an inquiry of the greatest moment in many instances; for, could we absolutely pronounce, in a tedious and painful labour, that the fœtus is dead, I am decidedly of opinion, that the mother ought not to be permitted to suffer long, if perforation of the head would conduce more speedily to terminate those sufferings. The argument, that the mutilation has an unpleasant appearance in the eyes of the friends, is perfectly worthless, if it be only granted, that so harmless an operation may diminish by hours—it may be by many hours—the throes and agonies of the patient. My own skill in the use of the stethoscope (although my confidence in the results it furnishes is considerable,) would not justify me in staking the life of the child on the evidence it might afford in *my hands*; yet others, I can and do believe, are so adroit and experienced in its employment, that they might justifiably act on the decision it enables *them* to arrive at.

if it is practicable, raise the cervix gently with the finger, so as to disengage it from the pressure of the head.

4. How long is the practitioner to rest satisfied with watching the efforts of nature? This will depend on their effect. If the head moulds readily, the tumefied scalp descends, and the bulging part of the cranium makes some progress through the inlet, we may hope that the base will ultimately be forced down without injury to the mother. But when it is the scalp merely which the pains affect, this is discouraging; and when the head, notwithstanding continued uterine pains, does not become fixed in the brim, but may be raised, on the cessation of pain, by the finger, then we have reason to fear either that the head is above the standard size, or that the inlet is more contracted than we had calculated. And what remains is to determine whether to perforate the head at once, or to try first what may be done by the long forceps or the lever; not failing to remember that the pelvis of the mother is not like that of the skeleton, but that it is lined, especially in the inlet, with textures at once most important to life, and easily injured by instruments.

Manchester, *20th May*.

Art. V.—*On the Influence of a certain Morbid condition of the Heart on the System at large.* By Richard Poole, Esq. Assistant-Surgeon 32d Regiment.

The influence of the heart on the different organs of the body, and, consequently, on their respective functions, need not be hinted at; physiologically, it is well known. But the connection of disease with some morbid conditions of the centre of circulation has received even of late only a small share of attention from the profession. This is singular,—for the inquiries during this time into the signs and symptoms of diseased structure of the organ have been multiplied to prolixity; while the most trifling circumstances relative to its motions or sounds have been magnified as important discoveries, and as acrimoniously discussed, by the physiologists of the day, as the rationale of its circulation in the time of its discoverer. Here, however, there is nothing new; the annals of medical warfare recording more contests for trifles than solicitude for the interest of the science,—an evil which, however much to be deplored, can never be remedied, but by the cultivators of medicine becoming more anxious for its advancement than their own. It was necessary to premise in this way the following observations, as some excuse for attempting to lead the attention of the profession to more important researches connected with the organ in question; any thing I have to offer on the subject being drawn from such limited facts, that nothing but the wish to do so, and the hope of eliciting farther information, could have induced me to bring them under notice.

When I said that the influence of morbid states of the heart in general disease had received but small consideration from the mass of observers, I was fully aware of, and prepared to give credit to, several who had pointed out the connection in this way, between certain active determinations of the circulating fluid to the different organs, and an over-energetic or hypertrophied state of the centre of circulation; coincidences at times so striking, and so readily associated, that we have every reason to regard them, though I allow an undue application may have lessened their value, as in many instances cause and effect. Nor will I deny that the conviction of this important fact led me to consider how far an opposite condition might tend to produce certain phenomena, however generally known, ill accounted for, from the very circumstance of the obscurity of their origin. I was, however, so situate, that the kind of cases required did not often occur; and I was prevented from coming to any conclusion on the subject which deserved to be known, till those about to be detailed fell under my notice. Although presenting features different from such as I had supposed pathognomonic of the cause, there needed but little penetration to understand them as links of the same important principle. Before passing to their history, it will be advisable to devote a few observations to that condition of the heart which I consider as their leading character.

I am far from giving to this the term disease, because, in the *first* place, I am convinced it has been acquired by many, who do not, and never may, become aware of its existence from any morbid affections produced by it, provided they are not placed under circumstances by which it may be aggravated; and *secondly*, because it appears in others according to the hints of Laennec, and the able translator of his work, as a congenital disproportion of parts, which may either influence the nature of all diseases to which the individual possessing it may become liable, or lay the foundation for actual disorganization of the viscus itself. In fact, I consider it far from improbable, that the author first named is correct in saying, that, in a great many persons, the parietes of one or both sides of the heart are either too thick or too thin from birth, and that, in such cases, the usual exciting causes, moral or physical, will be more apt to produce formal disease, than in individuals in whom this disproportion does not exist. With the latter part of this remark, we have nothing to do here, nor with that relating to the cases in which the parietes of the heart are too thick; our business being only with those in which a weakened condition is predominant. I need hardly say, that, in such cases, any active disease which supervenes would have some modification of character impressed upon it by such a condition of so important an organ; nor does it require much sagacity to show, consequently, that the plan of treatment adapted to them would require to be different from what might be suitable to others, in which the opposite condition obtained.

The inferences from viewing the question in this way are so striking, that I wonder how the facts have been so little noticed; and I am not a little surprised to find so fertile a field of speculation almost perfectly untouched. But so it is. The most recent writer on the heart glances at the subject in the following words, "In many persons the heart without being dilated has naturally thin walls; that is to say, (to assume a standard of comparison for an object which cannot have any fixed one,) the walls of the left ventricle are not, at the utmost, more than twice the thickness of those of the right. This state presents signs similar to those of dilatation, but in a less degree; namely, the impulse is diminished, the first sound is loud, short, and clear; and both sounds are more extensively audible than is natural. Individuals so affected may live for a great number of years, even to an extreme old age, in a state of tolerably good health; it is only to be remarked, that this conformation is in general accompanied with a delicate constitution, a slim stature, and small muscles. In fevers and diseases of the respiratory organs, the individuals in question experience, *cæteris paribus*, greater dyspnœa than others. If such a conformation augments even slightly a dilatation of the heart is the result."

These observations prove that the author was aware of a certain number of the facts, although he has given no more information concerning them; not, however, from appearing to undervalue them,—for, in a more recent publication, he states the importance of guarding such persons from exposure to the exciting causes of inflammation, and the necessity of treating these *promptly* when they occur. This, however, is all that Dr Hope, the writer alluded to, has said on the subject. The information communicated by Andral on this subject is equally unsatisfactory, although I have often been inclined to believe that he had the conditions in question before him, when alluding in his last work to the phenomena produced by the *anæmia* of organs. In no part, however, of his treatise on Pathological Anatomy are these referred to any condition of the centre of circulation; nor even in treating of dilatation of this organ does he allude to its influence in this way.

Broussais, in his work on the Chronic *Phlegmasiæ*, is the only author to whom I can refer who has taken up the subject in any other than a cursory manner; and some of his observations are so much to the point, that I cannot avoid quoting them at length, particularly as he records two cases remarkably similar to one I have to detail.

After discussing the characters and effects of hypertrophied hearts, he proceeds to say, " The varicose disposition which was for a long time confounded with the preceding, nevertheless differs from it essentially. The disease described by Professor Corvisart under the name of passive aneurism may most generally be referred to it; but I am convinced there exists *an innate disposition, which produces all the results of this aneurism.* The individuals in whom it occurs are usually weaker than those of whom I have just now spoken. They may also be endowed with a very powerful muscular system; but we very often observe, that they have a large heart, which pulsates in a flaccid manner, and with a kind of thrill or murmur at irregular intervals, a soft and compressible pulse, which does not correspond to the fulness of the central pulsations; a colour which verges on violet, and a protracted and sibilant respiration. These persons always dilate their thorax greatly during inspiration; they are not possessed of as active passions or movements as the preceding; they are less adapted for marching; and they have the peculiarity of easily taking cold, and have much difficulty in respiring in crowded places, or confined rooms. They are readily attacked with asthma and suffocation." Again, " Having closely observed my old fever patients, in whom the cough and dyspnœa, without heat, had been successively augmented by a recurrence of paroxysms,—having felt their heart during the moments of their most violent agonies—I have found that this organ experienced only slight thrills, that did not strike the sides in an energetic manner,—that its volume appeared to undergo but little variation. I also remarked a small feeble pulse, and an artery whose size and form were always the same. From these symptoms, I convinced myself of the embarrassment of the circulation, arising from a *weakening* of the heart." The cases of Bernard and Brossard, related by Broussais in this work, are illustrated further by many observations, proving the acquaintance of the author with the phenomena produced in general disease by this *weakening* of the centre of circulation.

Having thus in some measure reviewed the exact state of our knowledge on the subject, I shall proceed at once with my cases,—reserving for consideration afterwards the inferences to be deduced from them. I may just remark, that they are extracted from the daily journal of the hospital of the corps to which I am attached.

CASE I.—Corporal Cassidy, 32d Regiment, aged 28, admitted 8th May 1833, with an attack of the prevailing epidemic, (influenza.) This man has been long subject to pulmonic attacks, for which he has been frequently bled, and he bears marks of cupping in the cardiac region. His health lately has been good, and he appears in very good condition.

9th. Complains this morning of intense acute pain, referred at one time to the right middle chest, and at another, to the space under the ribs of the same side, without being at all increased in either situation by pressure. Complexion of an intense red or brown hue; the face apparently bloated. Lying with his head very high. Little or no cough. Breathing remarkably short and quick; the least attempt to take a full inspiration producing the pain in the chest. Pulse 133; well developed; a little hard. Skin hot and dry. Bowels free, from medicine given yesterday. The chest, examined by stethoscope, discovers pure respiratory murmur throughout; and the resonance is everywhere clear on percussion, except at the cardia, where it is slightly impaired. Impulse of heart weak; the sounds intensely clear towards the cartilages of the left ribs, and even over those of the right; the first as clear and brief as the second. Jugulars much dilated, but not turgid.

The following diagnostic note was made at the time. "It is impossible to say at the present moment to which viscus the phlogosis, if any, is to be referred,—no decided evidence of its location being afforded; but as it is fair to allow the existence of a very inflammatory condition, it is necessary to take precaution against its fixing in an important organ. I think it likely the right ventricle is dilated.

V. S. ad ℥ xx. *Solut. Antim. et Tinct. Digital.* The patient was tolerably easy at the evening visit, and able to take nearly a full inspiration without pain.

10th. Passed a bad night, having been attacked about 11 P. M. with violent rigors, which terminated with *rheumatic* pains from his head to his toes,—affecting, as he says, every bone in his body. Intercostal muscles of the chest very painful to the touch; he breathes, however, to-day easier than yesterday, and it is now only when *sitting up* and taking a full inspiration, that the pain in the chest is excited. Some nausea. Pulse again full, buoyant, without hardness. Skin warm. Complexion of a deeper tinge than before. *Colchicum in Mist. Camph.*

11th. Was easy all yesterday after the visit; and comparatively free from pain until four this morning, when he was again attacked with violent rigors, which lasted much longer than the preceding, and were followed by intense general heat and aggravation of the local pains. Presents now the countenance paler, but remarkably anxious and agitated; and his breathing particularly rapid and short. Decubitus only on back. Pulse 110; sharp, jerking, well-developed, without much hardness. Skin very dry and hot. The principal feature in the case at present is the remarkable anxiety, which appears out of all proportion to the actual suffering,—this being confined entirely to the general soreness, and occasional sharp stitches under the right ribs, on attempting to inspire deeply. He states, likewise, that immediately over the situation of the heart he experiences a dull pain; but, as he generally suffers from this on any great exertion, he pays no attention to its occurrence at present. He likewise feels here a sensation of tumbling, but no active or decided sense of palpitation. No headach to any amount. Some cough, but refrains from coughing as much as possible, as the attempt only increases his suffering. Bowels rather free. Much thirst. Both hypochondria bear pressure without the smallest inconvenience; but pressing the intercostal muscles of the right side gives some. Chest again fully examined, but nothing was discovered except the signs of the dilated condition of the heart.

The opinion then entertained is here given. "The difficulty of deciding on this case is great, as the general state of the circulation appears to indicate the existence of a phlogosis, which neither can the strictest examination detect, nor the condition of the heart corroborate. One thing, however, appears certain, that irritation of the heart exists to a very considerable degree, without any evident extraneous cause; and this may have for its origin either an inflammation of its substance or membranes, or a purely nervous or functional affection. Considering the weak state of the heart, and the little benefit derived from the last bleeding, the latter view is the one I am inclined to take."

Desct. in Bal. tepid. dein Hab. gr. ij. *ext. Opii. Submur. Hyd. c. Antimon. Tart.* gr. $\frac{1}{4}$.

Vespere. Has been bathed in perspiration all day, and remains now with the skin very moist, but intensely hot; pulse 111, still sharp, less full. States, that shortly after taking his pill, he fell asleep, and awoke free from pain of any kind, and that ever since he has been perfectly easy. He now breathes naturally; coughs freely; and takes a full inspiration without the least pain.

12th. Passed a very good night, and is still free from any pain, and can breathe with perfect ease; no anxiety; and he states that he is quite well. Pulse still upwards of 100; a little tense. Decubitus on either side. *Hyoscyam. et Tinct. Digital.*

13th. Still free from any pain; pulse 98, soft, rather small; complains much of weakness.

14th. Rather depressed, and weakened to such a degree that he can move only with difficulty. The pulse has fallen much in volume, having become feeble; but it still numbers about 100 in the minute. Complexion again a little turgid.—Sago and white wine. *Tinct. Mur. Ferri.* Beef-tea and a little meat for dinner.

19th. Improved much, with the exception of some swelling of face and ankles; no pains whatever; no cough; pulse slow, but not feeble. *Omit. Tinct. Chalyb. Cap. gr. x. Tart. Ferri ter.*

22d. Discharged cured to duty.

A dilated state, principally of the left ventricle, with general weakness of the organ, was clearly ascertained at several examinations to which the patient was subjected.

The following case is marked with less striking features than the preceding, but still it is characteristic.

CASE II.—Gunner and driver, Francis Carney, R. A. aged 28, admitted June 9, 1833, a man of temperate habits, subject to pulmonic attacks; chest misshapen, contracted in subclavian regions; has a constant cough; attacked last night with a violent stitch in right lower chest, which has continued nearly unabated up to the present time, and impedes respiration and the attempt to cough. Very great anxiety and depression; face brownish tint, turgid; pulse moderately developed, a little quick; some heat of skin, with a greasy softness; some nausea, and sense of oppression at *præcordia*. No loss of resonance of chest; loud, sonorous, grating, and sibilant rales throughout both lungs,—the respiratory murmur weak in the posterior and lower portions; impulse of heart awanting; slight *bruit de soufflet* attends both sounds.

Diagnosis.—Double *bronchitis*, with probably a dilated condition of the heart.

Eight ounces of blood abstracted from the arm,—producing great falling of the pulse, and partial syncope.

10th. Passed a tolerably easy night, and appears this morning better in most respects, though still suffering from the stitches on coughing, moving his body or arms, and inspiration. Pulse about 76, full, but not hard; thirst; much inclination to cough, but he checks the attempt, as it produces pain. The rales have disappeared. Still very great depression and anxiety; complexion and general appearance as yesterday.

A rubefacient to the chest. Calomel, opium, and emetic tartar. *Vespere.* No relief; symptoms as at the morning visit. Skin bathed in perspiration. *Hirud. No. vj. lateri dolenti.*

11th June. Leeches bled well; pain subsided immediately after they were applied. Can now inspire fully, without inconvenience. Was bathed in perspiration all night. Pulse about 68, soft, and calm; heart again examined, but nothing farther discovered than is mentioned in the report of the 9th; jugulars well developed, but not turgid.

12th. Better in every way; pulse not more than 60, small.

15th. Complains only of weakness; pulse for the last two days small and weak.

16th. Discharged to duty. It is probable that some valvular affection existed in this case along with the weakened condition of the heart.

The next case I consider the most prominent.

Case III.—Benjamin Baker, 36th Regiment, aged 20, admitted 9th October 1833. 9th. Came into hospital yesterday, complaining of headach and pain in his bowels, for which he had a little castor oil and *Tinct. Opii*, which operated four times with a good deal of griping. Presents now the following appearances, &c. Much anxiety; rapid and almost convulsive breathing; decubitus only on the left side,—the attempt to turn on the other productive of much increase of the uneasiness; short, nearly dry, cough, with only a little frothy expectoration; much pain in left hypochondriac and cardiac region, stretching up as high as the nipple, and described as a sharp and shooting pain. It is, however, not increased by full inspiration, but considerably so by pressure or percussing the left ribs. Headach; slight flushing of face; foul moist tongue; great thirst; anorexia; marked erethism; skin hot; pulse 114, pretty full, buoyant; urine of a blood-red colour, very scanty; chest contracted across the lower diameter; fulness in *scrobiculus* and *hypochondria*, with pain on pressure. Respiratory murmur developed throughout the chest; dull sound on percussion in both submammary regions; rapid, noisy action of heart, but no impulse whatever; sounds much diffused.

Diagnosis.—"I think the symptoms are due to an intense irritation (gastric) of a weakened heart." *Statim. App. Hirud. No. xviij. Epigast.*

Vespere.—Leeches bled profusely, producing faintness to a degree approaching syncope. The pulse has fallen much in force, and about ten beats in frequency; can now lie on the other side, and his breathing, though still short, is easier and less convulsive; slight rattle with the cough, which is now soft and loose. Passed a restless night, but is, on the whole, better to-day, although the fever is now unequivocally developed.

The pectoral disturbance, however, is nearly gone; and he now lies on either side, or on his back, without inconvenience; breathing regular and easy, a little quick; slight cough, but no expectoration; pulse 116, soft, and easily compressed; skin hot and dry; tongue dry, rough, red, hard fur in the centre; perfect anorexia; intense thirst; no nausea. Bowels moved several times yesterday; motions stated to be white; fulness of hypochondria gone; complexion turgid; complains much of headach, giddiness, and is apt to become very faint, pallid, and weak, when he gets up to go to the close stool. Heart destitute of impulse; sounds much diffused,—1st, remarkably clear about the centre of the sternum, the 2d rather duller.

The attack is one of fever with gastric complication; the pectoral disturbance merely the effect of the sympathetic irritation of a morbidly constituted heart.

Reapp. Hirud. No. vi. Epigast. Cold drinks. *Diaeta Regim.*

11th. Much better in every respect. Pulse had fallen about ten or twelve beats last night; it is now 84, soft, and calm. Skin barely heated; breathing easy; tongue becoming moist; anorexia; face if any thing pale, but not anxious. Bowels confined.—*Ol. Ricini* ℥*ij*. *Rep. alia.*

12th. Is apyrectic this morning; pulse barely 66, small, and feeble; no heat of skin; tongue moist; medicine operated five times; breathing natural; some flushing of right cheek.

13th. Had a sharp stitch in left side last night, which continued for about half an hour. Continues to improve in every respect; occasional attempts to cough.

14th. Pulse still very slow and soft.

16th. Pulse about 60, feeble. Beef-tea for dinner.

23d. Discharged cured, to proceed with his corps to Nenagh. Heart repeatedly examined, and ascertained to be weakened, with decided dilatation of the right ventricle.

It will be seen that in these cases there was a marked coincidence in symptoms, progress, and amenability to nearly similar treatment,—points which, putting the conditions of the heart out of the question altogether, are nearly sufficient to warrant us in inferring a similarity in their origin or cause. Let us review them, therefore, in this way. The characteristic feature of all is their intensity. We have a rapid supervention of alarming symptoms,—as, remarkable anxiety and dyspnœa, a very accelerated circulation, a turgid state of the features, the expression of which is that of great alarm; a short, convulsive attempt at cough; intense pain of some one or another part of the chest, and the developement of all the phenomena that constitute fever. In fact, we have at once almost, or at the most, along with some unimportant indisposition, the immediate appearance of symptoms which we are in the habit of attributing to the gravest lesions of the vital organs. Who, for example, would have doubted that Baker was the subject of a violent inflammation of the pericardium? I confess this was the first impression I formed relative to the case first detailed.* Nothing could be more complete than the simulation in both, and nothing but my conviction that both laboured under debility of the heart prevented me from adapting my treatment to this view. The consequences of it may be easily calculated;—for in both a marked tendency to *leipothymia* was produced by even partial depletory measures, this fact constituting another of the important features in their progress. But there are others. This formidable array of symptoms yielded almost at once to what might be termed trifling remedial means, and was followed by a condition as opposite, namely, one in which both the circulatory and nervous systems appeared almost exhausted. But again, the very fact of these formidable symptoms yielding, in all the cases, to trifling means, is another link in this chain of coincidences, doubly enhanced in value, when we discover, from the result, that the effect of these means was the same, namely, by acting sedatively upon the heart, and allaying the general disturbance of the system.

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* I am aware that intense cases of *gastritis* are frequently ushered in by symptoms of, apparently, violent disturbance of the thoracic organs,—in fact I could record more than one; it is, however, yet to be determined how far this simulation may depend on indisposition to disease in these organs, or the condition of the heart described in the accompanying memoir. It cannot, however, be denied, putting both these causes out of the question altogether, that pectoral symptoms are often dependent alone on irritation in the gastric passages; a fact readily explained by the intimate sympathy that exists between the respective viscera.

Such, therefore, is the agreement which the phenomena of these cases present; and I have to repeat, that its occurrence, even in the limited number of instances given, appears to imply similarity in cause or origin; but, when a certain condition of the heart is also found common to all, as ascertained by the means of diagnosis most to be depended on, and after repeated examinations, it becomes an object to discover how far this may be admitted as the cause in question. This is all I propose, for I am far from attempting to explain their dependence on each other. I give simply the facts as I found them, and leave the question to be decided hereafter, not at all considering that I prejudge it, by coming to the following conclusions, deduced from the facts as they occurred. It appears, then,

1*st*, That, in a certain condition of the heart, characterized chiefly by what we may term debility, the supervention of disease in any other part of the body may be marked by symptoms referable, in a great measure, to the state of this organ.

2*dly*, That these symptoms will be more intense in appearance, than indicative of great disturbance in the part affected by disease.

3*dly*, That, for their relief, active depletion is either unnecessary or hurtful.

4*thly*, That the treatment best adapted for their removal is such as has influence on the condition of the heart, rather than on the local disease.

5*thly*, That, after the general and local disturbances are allayed, there is greater tendency to collapse than in other affections having a different origin,—even although the treatment has been far from active.

It remains for me only to state, that the affections which I at first considered likely to result from this weakened state of the heart, were those dependent on a want of circulation in the different organs,—than which state I considered no other cause more likely to produce them. Such affections, according to Andral, may be similar to those occasioned by congestion, from which single observation we can at once form an estimate of their number, and the importance of their diagnosis. As already-mentioned, the facts which I have been able to collect on this head are too limited for any good purpose,—being composed of two epileptic cases, in one of which existed dilatation of one ventricle, with hypertrophy of the other; and in the second, verified by dissection, a dilated ventricle, with attenuation and softening of the heart.

Templemore, Nov. 11, 1833.

ART. VI.—*An attempt to account for the various methods adopted in the Treatment of Malignant Cholera.* By SAMUEL GASKELL, Esq. Stockport.

As an appearance of malignant cholera may be looked for in this country, it is desirable, if possible, to remove the distrust and indifference which is uniformly expressed at the mere mention of the word. The following reflections are offered with the view of exciting a little more attention to the phenomena presented in this disease, and also with a hope that they may have a tendency to remove some of the opprobrium which has been cast on the profession owing to the diversified and inefficient modes of treatment.

It will be readily admitted that the successful treatment of any disease requires that the course which it has pursued be carefully ascertained, and that the state of the patient at the time we prescribe be closely examined; from these we are enabled to estimate the degree to which the affection has proceeded, and we can calculate its probable termination. It is only upon such grounds that the reasoning practitioner can prescribe with satisfaction and advantage, and no disease presents a better illustration of their justness than the one under consideration.

I have previously endeavoured to show* that there are two modes in which malignant cholera invades the system, and that when fatal there are two modes in which it terminates; hence these two species ought especially to be regarded when deliberating on the choice of remedies. In the one class of cases the disease sets in with diarrhœa, and terminates by failure of the circulatory system—in the other class it sets in with oppression, and terminates by failure of the respiratory system. Further, in taking a view of the general course and termination of all cases of cholera, we perceive that although distinctive characters present themselves, yet in a certain period the diseased actions have terminated in death or recovery. If we are shocked by the rapid prostration or suspension of the vital actions, we are equally amazed at the rapidity with which they are restored from this state of prostration to the performance of their natural functions. Our wonder is excited, and we are aroused to inquire by what influence the vital actions have been so deeply embarrassed, and by the operation of what power they so quickly regained their healthy functions? It is difficult and uncertain to trace the intricate course of symptoms produced in the animal economy by the application of a known cause; but in cholera we are unacquainted with the properties of the agents. In what impenetrable obscurity, then, must that investigation be involved which attempts to arrive at a knowledge of the cause from the effects which it has produced on the system? But though such abstruse investigations would be calculated to mislead and confound the inquirer, analogy may do much to guide and enlighten him.

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* *Vide* Edinburgh Medical and Surgical Journal, July 1833, p. 52 and 94.

We are struck with the resemblance between cholera and the known effects consequent on the absorption of some deleterious poison into the system; and besides this parallel in the nature of the symptoms, we remark that the course of the disease observes the same determined pace as the results of absorbed poison, and the issue of it presents similar phenomena, viz. recovery in a certain period, or death from syncope or asphyxia. We are staggered by the feeble influence of our remedies in cholera. But we are already acquainted, that, when dealing with a person who has swallowed poison, the only direct influence we have over the agent is to cause its expulsion or to neutralize its properties; when absorbed into the system, we have no means of subduing its deleterious influence, and hence the actions induced proceed in a determined course unchecked by any remedial means. We know that poisons absorbed in small portions into the system produce a certain train of symptoms which endure a certain period, and then gradually abate; if the dose have been considerable, the vital functions are partly suspended, yet in due time they regain their wonted vigour; but if the dose has been large, one or other of these vital actions is totally arrested, and death to the remaining part of the system is the result. Although we are unacquainted with any means neutralizing the powers of a poisonous substance when absorbed into the system, yet, as we are aware of the mode in which life is destroyed by it, we endeavour to overcome its deleterious influence by exerting those actions which tend to disperse it. Thus if the powers of respiration are oppressed, or the heart's action abated, we put in force the appropriate remedies. We perceive then, that in the character of the symptoms, course of the disease, influence of remedies, and mode of termination, a striking resemblance between the phenomena of cholera and the effects of poison. We have also some grounds for tracing an analogy between the results of different doses of poison, with mild and severe cases of cholera.

In cases of cholera and poisoning, we observe the disordered functions restored to a healthy action without the intervention of any remedial means. The importance of this fact demands an attempt to ascertain what is the power by which it is effected? We are led to look for some endowment in the operations of the animal economy. We find instances showing, that where a deleterious agent has been absorbed into the system, it is rapidly thrown off in combination with some of the excretions.* We also see evidences that when the functions of an organ have become embarrassed, the system seems to have a power of accommodating itself to the diminished scale of action in the organ. One or both these powers may operate to sustain the vital action. The fact, that poisonous substances require a renewed application to keep up the effect previously produced, may favour either of these suppositions. The frequent administration of a poisonous medicine requiring an increased dose to produce equivalent effects may favour the latter. This is a point capable of much elucidation, but is an inquiry not compatible with the active duties of a public office. It is not my object, however, to demonstrate the mode in which such an endowment operates, but to prove its existence.

If we offer this as a solution of the means by which recovery is effected, what explanation does it afford regarding the mode in which death results? The effects of any physical agent on the actions of the system are proportional to the quantity of the agent employed, and to the power of the organ influenced. And as the power of an organ (*cæteris paribus*) is regulated by the power of the system, a dose of poison will in a weak constitution suspend a vital function, and thus destroy life; but in a strong constitution it will only embarrass the vital actions for a while. Death then seems to result from a potent agent applied to the system, or from feeble powers to resist it.

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* An instance lately occurred amongst the accidents at the Stockport Infirmary, when a man who had inspired carburetted hydrogen passed in four hours from the time of the accident, evacuations so impregnated with the gas that his wife feared to approach him with a candle.

I cannot dismiss this part of the subject without observing, that although in general the respiratory apparatus is affected by one set of poisons, and the circulatory by another, yet a large dose will affect one function, and a small dose of the same poison will show its influence on the other. May this account for the two species of cholera?

The foregoing considerations afford some grounds for believing that the actions of cholera are the result of an absorbed virus, whether an animal product or miasmatic agent does not affect the argument. To prove this it would be necessary to demonstrate the existence of such a virus in the system, and to do this would imply a previous acquaintance with its nature and properties. But suppose we had it in a tangible shape, and had subjected it to various tests, which had produced determinate phenomena, would this guide us in endeavouring to ascertain its presence in the system? The obscure trace which the best marked poisons afford when absorbed is sufficient to show that a knowledge of the qualities of a virus would be of small avail in determining its presence in the system. When a poison has been administered, and we have no means of obtaining a portion of it, we are guided to a knowledge of what poison has been absorbed, rather by the effects which it has produced, than by any evidence from tests of its existence in the blood.

Believing, then, that the choleric virus is discoverable by no tests, and that its deleterious effects are to be subdued by no specific, but that there resides in the actions of the system a power of combating and subduing its influence, our object in the treatment is to support these vital actions. We make ourselves acquainted with the mode in which they cease, and we find there are two, one by cessation of the heart's action, the other by oppression to the respiratory powers. We are aware from the symptoms which of them is in danger of extinction,—we apply remedies accordingly, and thus, by supporting the vital functions, contribute assistance to that hidden influence which has the power of restoring the turbulent actions to a state of peace. This observation of the general course and termination of cholera furnishes us the principles on which the treatment of it is founded, and attention to particular symptoms guide us in the application of remedies.

We have wandered from the point which forms the title of this article, and have been endeavouring to establish principles of practice, not attempting to explain how the use of an immense variety of remedies has been adopted. In taking up this part of the subject, however, we shall be greatly assisted by keeping in mind the foregoing considerations.

As we have reason to believe there resides in the animal economy a curative power capable of overcoming the actions of cholera, by omitting to reflect on this, or from ignorance of it, remedial powers may have been attributed to medicines which have had no beneficial effect. Nay, it is possible that means calculated to embarrass but not to suspend this salutary process have most erroneously been looked upon as curative agents, when by their interference recovery may actually have been retarded. Again we have seen that the circulatory system in one species of cholera is chiefly embarrassed, the respiratory in the other. The means of removing these two states are different; a remedy applied with advantage to one case is totally inapplicable in another. Hence it is not improbable that undue powers may from this circumstance have been attributed to a remedy as applicable to all cases of cholera, when it can be used with advantage in certain cases only. Hence also we find an explanation of the confidence placed by different practitioners in medicines of very opposite properties. Hence published reports have been issued of the apparent efficacy of some medicines, and of the real advantage of others: applications of the one may have been made without producing any real effect; beneficial or injurious effects may have resulted from the other, according to the species of cases treated.

To enumerate the remedies which have been employed in cholera, would be to transcribe the whole catalogue of medical agents, solid, fluid and aëriform, as well as caloric and electricity. Not only has every known medicine been applied, but every structure of the frame suitable to the application of a remedy has been selected. Thus the stomach, rectum, lungs, blood-vessels, and surface of the body have each in their turn been the medium for remedial agents.

The circumstance, that some practitioners have directed their remedial means solely against the minor symptoms, furnishes an additional explanation for the adoption of various medicines. Although this is a point of practice not to be entirely disregarded, yet the attention has in many cases been wholly given to a particular symptom, as the absence of bile or urine. A little reflection must convince us that the power which places the vital action under immediate constraint must necessarily check secretion, the performance of which requires that the actions of circulation and respiration be duly affected. Hence the method of restoring the secretion is not by administering stimuli which have a specific effect on the secreting viscus, but by removing the constraint from the vital actions. As well might we in inflammation of the membranes of the brain, by applying belladonna to the palpebra, hope to subdue the inflammatory action, and restore the natural dimensions of the pupil. A greater error than this has been, to attribute the whole train of actions in cholera to a particular phenomenon which arises in the course of it. This is (to use the same illustration) to attribute inflammation of the *meninges* to a contracted state of the iris. These attempts to localize the disease, although in the highest degree praiseworthy, do not warrant the application of particular medicines as one of the means to establish the validity. It furnishes, however, an additional illustration of the point we are considering, as it gives another reason for the adoption of various remedies. The liver, bile-duct, spinal cord, ganglionic system, and mucous membrane, have each been fixed upon as the seat of the disease, and remedies have been chosen accordingly. And why not also the heart, lungs, kidneys, muscles, or cellular tissue? If these organs had been fixed upon in the indefatigable attempt to locate the affection, (and they have claims equal to those previously enumerated,) to what part of the system could we have looked for another structure on which to improve it. Finding no function duly performed, we might be induced to attribute such general derangement to an imperfection in those actions on which the continuance of every other function is dependent. To exemplify the beneficial tendency of careful and continued observation in confirming a correct preconceived notions, I may relate, that, on first examining cases of cholera, believing the nervous system to be the seat of the disease, I was induced to search for a solution of the changed state of the voice in the nerves distributed to the vocal organs; observing the exemption of children from this symptom directed my attention to another solution of the phenomenon.

I cannot close these remarks without again alluding to the topics discussed in the commencement of the paper; for we willingly engage in the pleasing task of tracing additional evidences of those beautiful and salutary operations which endow the frame with a power of freeing the vital actions from the noxious influences to which they are enforced. We see exhibited in all structures of the body, even the most insignificant, a curious and wonderful provision by which the effects of external injury are averted; how much more indispensable is such a provision for averting the deleterious influences to which the vital apparatus is exposed. Whatever may be the process by which this is affected a continuance of action is essentially requisite, and the more vigorous it can be rendered the sooner will recovery be accomplished. The following additional facts illustrative of this point may be worthy of notice. In cases of cholera, we occasionally see instances where we have reason to believe that additional impediment to the circulatory powers is imposed by a peculiar state of the extreme vessels, and where-ever this is fairly established death is the result. * The fatality also of pregnant females, and those suffering from extensive organic diseases, must not be lost sight of. Means which depress action, as fear, aggravate slight symptoms into a marked case; those which excite and invigorate it, as exercise in the open air, remove a slight attack. The beneficial effects of the latter, I have more than once experienced in my own person. It is stated that a patient with marked symptoms being closely pursued by the hospital assistants from whose hands he had escaped, found a speedy remedy by thus exciting the system to increased action.

To have continued the analogy between the two species of cholera and the effects of different poisons would have been interesting, but would have borne imaginative tints rather than the plain marks of observation. I therefore close these remarks and submit them, not as the forced effusions from the study, but as the conclusions which have been arrived at during a close and continued observation of the disease to which they relate.

Stockport Infirmary,
Feb. 22, 1834.

Art. VII.—*On the preference which should be given in the Practice of Medicine to the Employment of the Seeds of Plants, when they (the seeds) possess properties equivalent to those possessed by other parts of the same Plant.* By Richard Pearson, M. D., formerly one of the Physicians to the Birmingham Hospital, and latterly Lecturer on Materia Medica in the Birmingham School of Medicine.

The advantages which the seeds of plants possess over other parts of the same plant are these:

1st, They keep better.

2dly, The administration of them is more simple and convenient.

3dly, Their doses are more ascertainable.

1st, The fresh roots, particularly of bulbous plants, such as the squill and colchicum, soon go to decay; and even when cut into slices and dried, those slices are apt to become mouldy, and consequently almost good for nothing. Then, with regard to the leaves, they certainly, if gathered at the proper season and carefully dried, keep well for a length of time. But how often does it happen that they are gathered *after* the plant has attained to its full flowering state, and consequently have an admixture of decayed and worm-eaten leaves; so that from attention or inattention to the time of flowering, they vary greatly in quality. Add to this, that they are sometimes gathered in wet weather, and cannot in that case be dried without the application of a greater degree of heat than is consistent, in many instances, with their volatile particles. Then with regard to extracts, particularly the watery extracts prepared from the recent leaves, how those extracts spoil by keeping, and how much they vary in strength. In hot weather they are so much altered by fermentation that the doses of them are quite unascertainable. For these reasons, the watery extracts should be superseded by the seeds in the form of a powder, in all instances where the seeds possess properties corresponding to those possessed by the extracts. From the objections to which the extracts are liable, the seeds are exempt. These, if gathered when perfectly ripe and in dry weather, and put into glass vessels closely stopped, retain their active properties for an indefinite length of time.

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* *Vide* Ed. Med. and Surg. Journal, cxvi. p. 62.

2dly, The administration of seeds is more simple and convenient than that of other parts of the same plant. If the required quantity of the seeds be reduced to powder by trituration with loaf sugar, such powder may be given to adults in one or two table-spoonful of *cold* gruel, or in one or two teaspoonsful of currant jelly. And to hospital and dispensary patients, and to the poor generally, the triturated seeds may be given in treacle, which is also well adapted to children.

3dly, The doses of the seeds are more ascertainable than the doses of other parts of the same plant. In general, from ℈j. to ℈jj. of the seeds, in the form of a powder, may be prescribed to adults; and from gr. x. to gr. xv. to young persons.* It is proper to remark, that the seeds should be preserved in their *entire* state, and only be reduced to the form of a powder as they are wanted for immediate use.

I am now to bring forward instances to show that in numerous families of plants the seeds possess the medicinal efficacy of those plants in a very remarkable degree. I will begin with the natural order UMBELLIFERÆ, under which head it will be sufficient to mention the seeds of *Carum carui*, of the *Coriandrum sativum*, and of the *Fœniculum vulgare (Anethum Fœniculum*, Linnæi*)*. In the natural order CRUCIFERÆ, it will be sufficient to instance the two species of mustard, viz. *Sinapis alba* and *Sinapis nigra.* In the natural order Solaneæ, we may instance the seeds of the *Datura stramonium*, the seeds of *Hyoscyamus niger*, and the seeds of *Atropa Belladonna.* I pass over the seeds of plants belonging to the natural order Leguminosæ, they being, with some few exceptions, used for food, and not medicinally. The same remark applies to the seeds of plants belonging to the natural order Gramineæ.

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* Except in the instance of seeds possessing strongly cathartic or narcotic properties. In that case, the doses must be very considerably smaller; only an eighth or a tenth of the quantity above stated.

Without regard to botanical arrangement, I shall now produce some examples of plants in which their medicinal properties reside exclusively in the seeds. It is from the seeds of the *Ricinus communis* that we obtain, by expression, that useful mild cathartic, castor-oil. It is from the seeds of the *Croton tiglium* that we obtain, by expression, that drastic, but, under careful management, valuable cathartic, Croton-oil. And it is from the seeds (improperly called nuts) of the *Strychnos nux vomica*, that we obtain that powerful substance termed strychnine.

But there are exceptions to the above remarks in favour of the medicinal activity of the seeds of plants; and not the least remarkable exception is that afforded by the *Papaver somniferum*, the seeds of which are totally destitute of narcotic properties, although it is from the capsules, in which they are enclosed, that we obtain opium. It is from the leaves, and *not* from the seeds, of the *Melaleuca cajuputi* that we obtain cajuputi-oil. It is *not* in the seeds of the *Momordica elaterium*, but in the green watery matter contiguous to the seeds, that the cathartic property of that plant resides. In like manner, the medicinal activity of the *Cucumis colocynthis* is contained *not* in the seeds, but in the pulp of the fruit.

I would next suggest, that great advantages would probably be derived from experiments, skilfully conducted, on the seeds of certain medicinal plants, concerning which we are at present without any accurate information.

It would be desirable to ascertain whether the seeds of the *Scilla maritima* are diuretic and expectorant in the same degree as the bulb of that plant? Whether the seeds of the common broom (*Spartium scoparium*, Linnæi, *Genista scoparia* of Lamarck, and *Cytisus scoparius* of later botanists,) are diuretic in an equal degree with the cacumina or tops of that shrub; for the decoction of the tops too commonly passes off by stool, instead of by the kidneys; so that in dropsical cases it cannot be persisted in for a sufficient length of time to effectuate a cure. I have stated in my Synopsis of the Materia Medica (last edition, p. 201,) that the seeds of the broom in full doses are apt to vomit, rather than to purge. I do not recollect my authority for this observation. It is not founded on my own experience; but as the broom-seeds contain *cytisine*, it is highly probable that, in considerable doses, those seeds may operate as an emetic. In small doses, administered in the way in which I recommend that seeds should be administered, I should expect they would prove diuretic. Professor Murray of Gottingen, in his Apparatus Med. (Vol. ii. 445,) has the following remark.—*Semen [Spartii scoparii] in decocto blande vomitum movere, Lobelius auctor est.* But no mention is made of the quantity of the seeds, nor of the quantity of water in which they were boiled, nor of the doses in which the decoction was given. Messrs Mérat and Lens, the able editors of the Dict. de Mat. Méd. have, indeed, mentioned (Tom. iii. p. 354 of that useful work,) that the seeds of the broom, infused in white wine, have been found to be an excellent remedy in dropsies; but no special authority is given, nor any detail of cases. They refer, it is true, to the Anc. Journ. de Médecine, Tome lxi. 209, a work to which I cannot get access. On the whole, it is desirable, by new experiments, to ascertain in what doses the seeds of the broom will produce a diuretic effect in dropsical cases, without acting as an emetic.

In many dropsical cases it may be useful to add to each dose of the broom seeds a double or triple proportion of some of the aromatic seeds in powder, (carraway seeds, for instance,) to prevent nausea and purging.

I shall endeavour to prevail with an able and scientific physician, attached to one of the public charitable institutions of this town, to put some of these, besides other suggestions, to the test of experiment; and the result will in due time be forwarded to you, either by that gentleman or by myself, as a sequel to the present communication.

Birmingham, *May* 10, 1834.

ART. VIII.—*Case in which urgent symptoms of Asthma appeared to be induced by Electricity excited by New Feathers.*

Communicated by JOHN ROSS, Esq. Surgeon, Auchtergaven, Perthshire, Licentiate of the Faculty of Physicians and Surgeons, Glasgow.

JAMES CRICHTON, a stout athletic ploughman, aged 30, residing at Broompark, Auchtergaven, Perthshire, having been recently married, took up house on the 1st April last year, when, upon retiring to rest for the first time in his new home, he was seized with a difficulty of breathing, which, for the space of three weeks, gradually assumed a more alarming aspect, and finally compelled him to remain whole nights by the fire, the sense of suffocation while in bed being so intense. In this situation the invalid had recourse to blistering, which had the beneficial effect of lessening its virulence for the time; but the anticipated result not being realized by this treatment, the idea suggested itself, that as the dwelling in which he resided had been recently repaired and plastered, it was probable that his complaint derived its origin from this source. By advice, therefore, he removed to his father's house adjoining, where he remained till the 20th May. This arrangement, however, likewise proved unsuccessful; the nocturnal paroxysms were as frequent as ever, and his constitution was gradually yielding to the ardour of his complaint.

As he had frequently previous to this consulted several medical practitioners, and by their instructions had used several antispasmodic purgatives without any apparent relief, he now resolved to leave home, in hopes of deriving benefit from a change of air. He returned upon the 25th May, having been absent five nights, during which period he slept soundly and unmolested by his former visitor. Conceiving that he might now enjoy the pleasures of his own bed, he again returned; but his tormentor was still an occupant of the dwelling. He tried two nights in the barn, but here likewise did his nocturnal foe pursue him. In this situation he again had recourse to his father's roof, under which he enjoyed the best of health for the space of three weeks, but at the expiration of which his complaint returned with increasing severity, and continued nearly a month.

In this situation he again had recourse to a change of air, and during the week that he was absent was free from his ailment. He returned again to his father's house, where he continued some days unmolested. From this he removed to his own house where, from the virulent attacks of his former complaint, his health was so much impaired that serious apprehensions were entertained of his recovery. At this time he left home again for a few days, and was tolerably well. A return to his own house, however, precipitated him once more into his former trouble. After a week's fruitless efforts to enjoy repose during the night, he removed to a friend's house, where, for the space of a fortnight, he slept tranquilly, never experiencing any return of the paroxysms. His father's house for a considerable time subsequent to this period proved equally successful, but he was still convinced that the old neighbour continued to reside in his own house, by the frequent unsuccessful attempts at repose that he there experienced.

When he waited upon me about six weeks ago, I called to recollection a statement that I had somewhere read relative to the effects of electricity in feathers, illustrated by a case in some particulars similar to the present. I asked my patient if it was a feather bed that he slept upon, but was answered that it was chaff. In the course of conversation, however, I discovered that the bolsters were feathers, and I requested him to discontinue their use, and substitute chaff in their place, and let me know the result; when, upon calling next day, I found what I had anticipated, that he had passed a sound night. I then requested him to continue the chaff for a few days longer; he did so, and remained perfectly free of his complaint. I then requested him to try one night again upon his feather bolsters, but not for some time could he be prevailed upon to make the experiment; and when he did muster resolution enough to make the trial, his old complaint returned with its usual violence. In this situation he threw the bolsters from him violently, and was an hour or two tormented before the paroxysms ceased.

I have ascertained beyond the possibility of doubt, that, at the time he had been afflicted in his father's, &c. his own feather bolsters had been removed hither. In short, no night did he sleep upon these bolsters but he experienced the nocturnal paroxysms. Though sometimes he was affected immediately on going to bed, yet frequently two or three hours elapsed ere he was attacked.

It may be worthy of remark, that he had regularly slept upon feather bolsters during the former part of his life without feeling any such sensations; but that these were old, whilst the present were new. His wife and other individuals had slept upon them during the most part of this period without experiencing the least inconvenience.

ART. IX.—*Additional Observations upon Arsenic.* By ALEXANDER MURRAY, M. D. and A. M. Licentiate of the Royal College of Surgeons, Edinburgh.

SINCE the observations upon arsenic already published in this Journal were made, I have continued to devote some attention to the subject, chiefly for the purpose of ascertaining the effect of the modes of detection formerly described in the difficult and important cases wherein the poison is combined with animal, vegetable, and mineral substances; and these methods when applied to liquids have been in many instances compared with the common plan of conducting the process in a tube. I shall now endeavour to give a short account of the facts to which this inquiry has led.

A portion of common arsenic was added to an equal quantity of cream of tartar, and to a little of this compound, rubbed upon writing-paper, nitrate of silver was added, and afterwards gaseous ammonia, according to the manner previously mentioned, when the yellow arsenite of silver was produced in a distinct form. The copper test, applied in a similar way, caused a blueness, which was followed by the green colour of the arsenite of copper. A mixture of equal parts of arsenic and James's powder was tried with the silver test used as before, with a similar result; and upon this combination the copper test also acted in its usual manner. Equal parts of antimonial powder and arsenic were likewise tried with both tests, and with the same effects.

From their similarity of appearance it might not be difficult to conceal arsenic among any one of these common powders. The preceding examination was, however, made, not on account of any great probability of similar mixtures actually occurring, but chiefly out of a wish to determine how far the silver test would detect arsenic when it was added to substances containing acids, one of which was likely to cause an imitation of the arsenite of silver, and the other to prevent the formation of that salt. It was, however, found, that when the nitrate of silver was added to the antimonial preparations, no token of phosphate of silver was perceived, nor did the acid of the bitartrite of potass interfere with the result beyond creating a necessity for a more protracted and efficient application of ammonia.

A mixture of equal parts of arsenic and phosphate of soda in powder was rubbed upon paper, and yellowness was found to be occasioned both by the ammoniuret and the nitrate of silver. A drop of *aqua ammoniæ* was added to a very small quantity of the ammoniacal nitrate, which, after this addition, was found to have no evident effect upon phosphate of soda, while it continued to produce the usual yellow colour with arsenic. The test thus sharpened, being added to the mixture of arsenic and phosphate of soda, readily produced yellowness. Upon this compound, sulphate of copper, followed by the vapour of ammonia, produced a blue colour, which ultimately passed into green.

Table-salt was added to an equal portion of common arsenic, and when a small quantity of this mixture was rubbed upon paper, and the nitrate of silver applied to it, followed by the vapour of ammonia, the yellow arsenite was produced in the most distinct manner. In this case the copper test was not found to act in the usual way, as a solution of the sulphate of that metal, formed with common salt a lively green substance, differing in hue from the arsenite, and which is no doubt the muriate of copper.

The trials with phosphate of soda and table-salt were suggested by the consideration, that these substances have long been reckoned a stumbling-block in the way of the silver test. They were, indeed, adduced as sources of fallacy at an early period, and it may not be amiss to advert briefly to their connection with the history of nitrate of silver as a test for arsenic, since a considerable degree of interest is attached to the subject, and the facts, if I recollect aright, have not been stated always with perfect accuracy.

It appears that this method was proposed in 1809, by Mr Joseph Hume of Long Acre, who used the nitrate in conjunction with potass or soda. Certain objections to these alkalies were found to exist; and in the second volume of the Medico-Chirurgical Transactions, Dr Roget recommended a method pointed out to him by Dr Marcet, which consists simply in adding in succession to the suspected fluid, minute quantities of solutions of ammonia and of nitrate of silver. In Nicholson's Journal for December 1812, Mr Sylvester of Derby, in a paper upon metallic poisons, urged the following objection to Dr Marcet's proposal:—" If ever muriatic acid be present, the test is then wholly useless, as a muriate of silver will be immediately formed, and the yellow compound, said to be so unequivocal in its indication of arsenic, of course be prevented from appearing."

In the course of a few weeks, Dr Marcet (Med.-Chirurg. Transactions, iii. 342,) proposed, in the following words, to remove the fallacy which Mr Sylvester had pointed out. " To the suspected fluid previously filtered, add first a little dilute nitric acid, and afterwards nitrate of silver till it shall cease to produce any precipitate. The muriatic acid being thus removed, whilst the arsenious acid (if any, and in whatever state,) remains in the fluid; the addition of ammonia will instantly produce the yellow precipitate in its characteristic form." Dr Patrick Forbes, King's College, Aberdeen, being, it appears, unacquainted with Dr Marcet's method of obviating the objection which arises from muriatic acid, made a similar proposal with the same object a few years ago. Dr Marcet's proposal has, indeed, been noticed by various writers; but whether it has been in any instance adopted in actual practice, and found useful, I have no means of knowing. A far better means of obviating the difficulty will, I think, be found in the method now proposed, of applying the silver test, which, while it succeeds well, as before noticed, in a mixture of common salt with arsenic, will be immediately shown to be equally efficient in the liquid condition of these substances.

Equal parts of a strong solution of table-salt and of a solution of arsenic were mixed. To a drop of this put upon paper, nitrate of silver was added, and the subsequent exposure to ammonia produced a distinct yellow crust. Various experiments were also made upon the same ingredients, in different proportions, from the case wherein the quantities were, one part of dissolved salt, and nine of the arsenical liquid, up to that in which the solution of salt was nearly the double of the solution of arsenic. In every one of these combinations, the nitrate of silver, followed by gaseous ammonia, caused the formation of the yellow arsenite; whereas in each of them, when placed in a tube, the ammoniacal nitrate produced nothing but a copious white precipitate. When the compound consisted of ten or twelve parts and upwards of arsenical solution to one part of dissolved salt, a tolerable yellow was formed even in a tube; but this colour gave place, in general, very quickly to the whiteness of LUNA CORNEA (chloride of silver.) The exact composition of the solution previously referred to being unknown, for the sake of showing the strength in an accurate manner, I dissolved two drachms of table-salt in one ounce of water, and upon this solution several experiments were made. It was tried with thrice as much of the dissolved arsensic, and, indeed, with various proportions, even as far as to five parts of the solution of salt to one of that of arsenic. In all these instances, the arsenite of silver was formed by means of the method so often referred to. It is to be added, that the copper test was found to produce its characteristic effect upon liquids, composed of table-salt and arsenic in a state of solution.

Dr Marcet endeavoured, as has been mentioned, to dispose of the fallacy arising from muriatic acid, but it was not long before he found himself called upon (Med.-Chir. Transactions, vi. 663,) to notice an objection pointed out to him by a student at Guy's Hospital, namely, that an alkaline phosphate causes, with nitrate of silver, a yellow precipitate closely resembling the arsenite of silver. Dr Marcet, naturally anxious that the test should not be conducive to dangerous error, rather than to useful information, in the most candid manner, made public the objection, though it does not appear that he was provided with any very satisfactory answer to it. Mr Hume, however, afterwards formed the compound now named the ammoniacal nitrate, which was believed to act upon arsenic, without affecting the phosphate of soda in any evident manner. This opinion here, within certain limits, is yet not strictly correct; but in practice it may in general be safely enough acted upon, as there is very little chance of any case occurring in which the phosphate is so strong as to produce yellowness with the ammoniacal nitrate. When, however, nitrate of silver indicates the existence of phosphoric acid, it might be prudent to adopt the plan suggested in a preceding part of this communication, viz. in a careful manner to increase the ammonia in the ammoniuret, just to the point at which it ceases to cause a yellow colour with a saturated solution of phosphate of soda. It will still be found effective so far as arsenic is concerned, and therefore will detect this poison though mingled with the strongest phosphate. Between the arsenite and phosphate of silver I am aware that various distinctions might be set down. The latter seems to be more soluble in *aqua ammoniæ* than the arsenite, and less so in nitric acid, while it is also more readily altered by exposure. But I feel convinced that these distinctions ought not to be applied to use, when any important question may be influenced by the opinion.

The effect of decoction of onions upon the present subject may next be adverted to, as great interest has, from accidental circumstances, been attached to this source of fallacy, first noticed upon the occasion of a trial which took place in 1817. Dr Neale, a physician at Exeter, deponed that he had added to a decoction of onions both the copper and silver tests, and that the former produced "a green precipitate," and the latter "a pale yellow cloud." Upon this point the following observations have been made.

A small quantity of decoction of onions was put upon paper, and tried with the silver test, which produced yellowness, but not the full yellow surface which was formed when the same steps were gone through after arsenic had been added to the liquid alluded to. The similarity, however, is such, that I do not think this test could be relied on in such a case. Sulphate of copper having been added to a drop of decoction of onions placed upon paper, a green colour ensued; while the addition of ammonia caused blueness, but not in the usual ready manner, and this colour did not afterwards disappear, giving place to a distinct green, as it usually does when there is arsenic, and as, indeed, it was found to do when I added arsenic to the decoction of onions. Perhaps, then, the circumstance just mentioned forms the best distinction that can be derived from the copper test between a mere decoction of onions and the same liquid containing arsenic. After all, the matter is of but little moment, as there is not a shadow of reason to suppose that any one should have occasion to seek for arsenic in a pure decoction of onions. Yet the objection has been brought forward not merely in a general hypothetical way, but it has actually been adduced in criminal trials, both in this country, as already stated, and likewise, I believe, in America.

With the exception of onions, the foregoing observations have been made upon substances of a mineral nature combined with arsenic. Let us next turn to the more difficult cases, wherein the poison is combined with the animal and vegetable substances, composing the ordinary articles of food and drink. Dr Christison, in an elaborate dissertation upon the detection of arsenic in mixed fluids, has well observed, that the inaccuracy of the liquid tests is to be attributed to four circumstances, which may be thus stated. 1. The colour of the precipitate, though in reality not altered, appears to be changed, because it is viewed through a medium of a different colour. 2. The precipitate is really changed in colour. 3. It is kept suspended. 4. It is soluble in the vegetable or animal principles of the fluid, and therefore does not separate.

These sources of error, it is evident, might be expected to come into fuller operation when the process is conducted in tubes, than when the tests are applied in the manner which has been recommended; but as observation only can determine the point, certain experiments have been made, which are next to be related.

In the *first* place, without, however, saying that I have by any means completely investigated the point, I would observe, that though copper forms an excellent, and, so far as I know, an unexceptionable means of distinguishing solid arsenic, I have found no reason for thinking, that it ought to be relied upon in compound liquids, as various preparations of this metal make so near an approach to one another in colour, particularly when in some degree disguised and altered, that any distinction derived from difference of appearance cannot be put to practical use in cases like those now adverted to.

Coffee.—One part of a solution of arsenic was added to four parts of coffee. To a drop of this combination placed upon writing-paper, nitrate of silver was added; and when the spot was exposed to hartshorn fumes, a decided yellowness was observed. A distinct arsenite was also formed in this way, when the proportion was 1 to 6; and the yellow, though of short duration, was at first tolerably good, with 1 part of arsenical solution to 9 of coffee. The two first of these combinations were put successively into a tube, and tried with the ammoniacal nitrate of silver, when a brownish precipitate took place, from which the existence of arsenic could not have been inferred. Upon coffee placed on paper, the silver test produced a dark-brown colour.

Tea.—Equal parts of arsenical solution and tea were tried as before, when a very distinct arsenite was produced. Similar trials were made with success, when the proportions were 1 to 3, 6 and 9 respectively, but with the last of these forms, the yellowness was very transient. All the four preceding combinations were put into a tube, and tested with the ammoniacal nitrate. Even in the solution strongest in point of arsenic, there was a reddish-yellow precipitate of no well-marked character; with the next strength, the precipitate was brownish; and in the two weakest solutions the appearances were altogether indistinct. When a drop of tea was put upon paper, the silver test produced with it a dark-brown colour.

Broth.—One part of common broth was added to 1 and to 2 parts of arsenical solution, in both which cases a very unequivocal arsenite was produced by the silver test used as before; 1 part of the solution was also added to 3 and to 6 parts of broth. In the former of these combinations, evident yellowness was produced, and even in the weaker of the two, the test occasioned a milky-yellow. The same four proportions were tried in a watch-glass with the ammoniacal nitrate. In the two last cases, a snow-white precipitate was observed; and even in the two first and strongest combinations, the yellow was not of a distinct kind, nor could it be well observed, as it was speedily succeeded by a dense whiteness. Indeed, when five parts of arsenical solution were added to one of broth and tried in a tube, the precipitate had not the character of arsenite of silver in an extremely distinct form. When broth was put upon paper, both the ammoniuret of silver and the nitrate produced a snow-white appearance.

Milk.—A combination was made of milk and solution of arsenic, in the proportion of one part of the latter to four parts of the former. A drop of this being put upon paper and treated with nitrate of silver, followed by hartshorn fumes, became unequivocally yellow. A good enough arsenite was also produced, when one part of the solution was added to six of the milk; and the same method caused a pretty distinct yellowness when the proportion was 1 to 9. In a watch-glass, however, and in a tube, even the strongest of these combinations did not answer very well with the ammoniacal nitrate, as the arsenite, though undoubtedly formed, was much obscured by the medium through which it required to be seen. Upon milk itself, the silver test produced no change of appearance.

Porter.—One part of arsenical solution was added to 3 parts of porter, and a drop of this combination being put upon paper, the nitrate, succeeded by ammonia, caused a distinct yellow appearance. I also tried 1 to 4 and 7 parts, in both which cases a pretty evident arsenite was produced; but in the latter, the yellow very soon became dark. Even when the compound was the strongest of the above, (viz. 1 to 3,) nothing could safely be inferred from the precipitate in a tube. When porter alone was put upon paper, the silver test produced a dark colour with a yellowish tinge.

Gruel.—One part of the solution of arsenic was added to 4 and 6 parts of common water-gruel, in both which cases a good yellow arsenite was formed upon paper; and a distinct enough result was likewise obtained, when the proportions were 1 to 9 and 12. In a tube the precipitate was of a whitish uncertain character, with 1 part of the solution to 9 of gruel and upwards. When gruel alone was put upon paper, both the ammoniuret and the nitrate produced whiteness.

Whisky-punch.—One part of arsenical solution was added to

10, 20, and 40 parts of punch, and in each of these cases the yellow arsenite was distinctly formed upon paper. Regarding the same ingredients tried in a tube, I have only a single memorandum, which is to the effect, that 1 part of solution of arsenic was added to 10 of punch ; and, when this combination was put into a tube, the ammoniacal nitrate caused yellowness, but there was no precipitate.

Pease-soup.—Four and six parts of this liquid were combined with one part of arsenical solution, and in both instances a distinct arsenite was occasioned on paper by the nitrate of silver, followed by ammonia. The strongest of these compounds was put into a tube, and the action of the ammoniacal nitrate could not be perceived.

A few observations were also made upon more complex articles.

Equal parts of broth, small beer, water, whisky, and arsenical solution, were mixed, and a good permanent arsenite was formed upon paper, by the ingredients of the silver-test used separately as before. In a tube, the ammoniacal nitrate caused a yellow surface, but this colour almost immediately became indistinct. One part of arsenical solution was added to 3 of broth, 3 of water, and 3 of small beer, and the silver test occasioned upon paper a good enough yellow, though it was not permanent. In a tube, the ammoniacal nitrate had no effect but that of producing a momentary yellowness upon the surface. One part of arsenical solution was added to 3 parts of each of the following articles,—whisky-punch, pease-soup, and coffee. Upon paper, the silver test produced a good yellow arsenite, which, however, soon altered to a brownish colour. Upon a portion of this combination put into a tube, the ammoniacal nitrate produced a straw-coloured appearance. Equal parts of arsenical solution, whisky-punch, broth, decoction of onions, and solution of table-salt, were combined. The silver test, applied as before, caused an undoubted yellowness with this liquid ; but when it was placed in a tube the ammoniacal nitrate caused a white surface.

Various other experiments, which it appears unnecessary to relate, were made upon alimentary articles. I may, however, observe, that, when port or sherry, combined with solution of arsenic, was tried in a tube, the ammoniacal nitrate was found to be an exceedingly imperfect test ; but I must add, that in both these instances, a similar experiment performed upon paper produced very little advantage. The same remark applies to ale; but when small beer was added to the solution, it was found that a good yellow could be formed upon paper, even when the proportion was 1 part of the arsenical liquid, to 34 parts of beer.

Perhaps enough has now been said to warrant the inference, that the method of detecting arsenic which I have ventured to recommend, is frequently more useful than the common manner of using the same agents, particularly the silver test. To a few points which appear to have been established by the present observations, it may be allowed me to allude in a very brief manner. First, it may be mentioned, that, though copper forms an excellent and, so far as I know, an unexceptionable means of distinguishing solid arsenic, nothing occurred to show that the test into which this metal enters ought to be relied on in animal or vegetable liquids. By the silver test it has been found possible to distinguish arsenic in combination with table-salt, whether in the solid form * or in solution; and this may be easily done when the proportions are such that it would be extremely difficult, if not altogether impossible, to form the arsenite in any other way. To direct that nitrate of silver be added to an arsenical liquid containing muriatic acid so long as a white precipitate takes place, after which the usual steps are to be followed, is no doubt a simple and plausible expedient; but I feel convinced, that, in many of the cases previously mentioned, wherein another mode was found to succeed in the most ready and complete manner, the expedient alluded to would be found so tedious, troublesome, and even expensive, that if adopted, the chance is but slender of its being brought to any useful conclusion. In the extreme case of those previously noticed, in which the arsenite was formed upon paper, it may be safely stated, that the quantity of salt was 20 or 30 times that of the arsenic. It has farther appeared, that there are many other cases wherein an undoubted arsenite can be formed upon paper when no kind of opinion can be derived, from the appearance of the precipitate in a tube or glass, caused by a similar test on the same liquid. This is true of a combination of arsenic with tea, coffee, broth, gruel, and the other articles of food and drink, either singly, or in such mixtures as have a chance of being met with in the stomach. It is worth adding, that, while there are many cases in which the method recommended is superior to the common one, I do not recollect a single instance wherein it is inferior, though some could be named in which the two modes are pretty much upon an equality.

I wish to state, that it appears proper in all cases, not only to use the nitrate followed by gaseous ammonia, but also to try the ammoniacal nitrate upon a drop of the suspected fluid

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* A mixture of salt and arsenic is not to be considered a hypothetical condition of matters which has never actually occurred. Cases met with in the district of Alford, which various writers, both British and foreign, have done me the honour to quote, are recorded in the 18th volume of this Journal, wherein poison was administered to several individuals, by means of arsenic put among the salt made use of in the family.

placed upon paper. This is mentioned, because I find that sometimes the ammoniacal nitrate, and sometimes its components, used separately, are the best means of forming the arsenite of silver. Either of these modes, particularly in organic liquids, often produces a more decided arsenite than we meet with in the common tube experiment; and both methods also possess the advantages, consisting in great facility of execution, and in withdrawing so little of the liquid, as not to interfere with the trial of any other experiments which may be deemed necessary. It ought to be noticed, that I have more than once seen a yellowish liquid deepened in colour by the ammoniacal nitrate or its ingredients applied separately, which caused just such a change as ammonia or any alkali produces with a vegetable liquid of the colour referred to. This appearance, however, is quite different from that of the arsenite of silver, which, as formed upon paper, usually exhibits a decidedly yellow glazed surface, having a degree of metallic lustre. Unless the yellow is well-marked, it ought not to be trusted to as a token of arsenic; and keeping this remark steadily in view, it is satisfactory to think, that though liquids may be met with which contain arsenic, without its being possible to prove its existence, yet, on the other hand, no case will occur wherein this poison is not present, in which the silver test applied upon paper will lead us to pronounce that arsenic has been detected. In short, if a bright glistening yellow surface is formed, not by the nitrate of silver alone, but upon the subsequent application of ammonia, we are entitled to believe that arsenic is present. It ought to be recollected, that if we operate upon an arsenical liquid having alkaline characters, the nitrate itself will produce the yellow arsenite of silver.

As to the quantity of arsenic detected in the preceding experiments, it is difficult to make an accurate statement, as opinion differs very much regarding the strength of a watery solution of this substance, and also because, in the course of the investigation, different solutions were used at different times. These were prepared with no particular pains, and no means were used to estimate their composition; but judging in a rude way by the effect of tests upon them, when much diluted with water, my impression is, that the solutions alluded to were much below what is usually alleged to be the full strength of liquids of the same kind. Were it to be supposed that they contained 10 grains of arsenic in the ounce, then the addition of 1 part of the solution to 4 parts of another liquid would create a compound containing 2 grains per ounce. When the proportion is 1 to 9, we have 1 grain per ounce, and there is half a grain in the same quantity when 1 part of the arsenical solution is added to 19 parts of another liquid, and so on. The proportion of arsenic that may be detected will depend in part both upon the nature and the quantity of the liquid to which the arsenical solution is added; and this leads me to say, that several of the liquids employed in these experiments were filtered, and that the tea made use of was perhaps below an average strength. I must express a suspicion, not, indeed, a new one, that the simple addition of arsenic in powder to a compound liquid, will sometimes be followed by very little solution indeed,—but it is evident that when the nature of the liquid creates an obstacle to solution, to a similar extent are the chances increased of getting the arsenic in a solid form, by means of a careful examination; and if so obtained, it may be distinguished by any of the methods proposed in the first of these papers. It is also apparent that in these cases the addition of boiling water may cause the solution of the arsenic, and reduce the whole to the state of a liquid, to which (as in these experiments) a proportion of arsenical solution has been added.

Regarding the manner of performing the experiments, I have little to offer. They may, so far as my observation goes, be performed upon all the common kinds of writing paper; but they do not succeed upon bibulous paper, because the liquid runs into its texture; nor, for a similar reason, can arsenic, when combined with strong spirituous liquors, be detected upon common paper. In these remarks, a drop of the arsenical liquid has usually been referred to; but a smaller proportion is amply sufficient, and is, indeed, perhaps a fitter quantity. The method which I have usually adopted, both with the ammoniacal nitrate and its ingredients, used separately, has been to place upon paper as much of the arsenical liquid as was lifted on the point of a small rod, which was afterwards spread out a little, so that it could scarcely be said to be raised above the surface. In a similar way the ammoniacal nitrate was added, or the nitrate when it was used in solution. I am unable to give a general rule as to whether the nitrate of silver should be used in this form, or in the solid state. At first I made use of the solid nitrate, from a fear of the effect being impaired by the addition of a diluent, but it afterwards occurred to me that dilution, in place of being injurious, might perhaps have a very different effect, as it appeared possible that the addition of water, though weakening the arsenical strength of the liquid, might often more than counterbalance this, by removing or diminishing some of the obstacles created by organic liquid, namely, the want of transparency, and the action which such fluids exert upon arsenical compounds. The following short memorandum proves that the concentration of suspected liquid, with the view of favouring the effect of tests, may be often a step of questionable propriety, and they perhaps suggest a line of proceeding which might be sometimes resorted to with advantage in practice.

Equal parts of tea and arsenical solution were mixed; and when a portion of this was put in a tube along with 4 parts of water, the ammoniacal nitrate produced a distinct arsenite. Three parts of tea were added to 1 of the solution; and upon a portion of this, combined with 3 parts of water, the test produced an evident yellow. With 7 or 8 waters, a beautiful arsenite was formed. One part of arsenical solution was added to 6 parts of tea; and when the compound was put into a tube along with several volumes of water, a distinct enough arsenite was formed, though it soon became dark. One part of arsenical solution and 9 of tea were diluted with water, when the ammoniacal nitrate, in a favourable light, produced a good, though evanescent yellow. Contrast with these observations the fact, that when the strongest of these combinations, viz. equal parts of the two liquids, were tried in a tube with the ammoniacal nitrate, the precipitate was brownish, and entirely unlike the yellow arsenite. One part of arsenical solution was added to 1½ of port wine; upon this, in a tube, the silver test produced a brown precipitate, but when diluted with water a good enough yellow was formed. When the proportion was 1 part to 2 arsenical solution, the combination when diluted was distinctly acted upon by the test, which produced a good yellow; but even this strength when undiluted was only yellow at the very surface. When touched with a rod dipped in the ammoniacal nitrate, 1 part of arsenical solution was added successively to 1, 2, 3, and 4 parts of laudanum. With the greatest strength, (viz. equal parts) the silver test produced in a tube and watch-glass a whitish yellow curdy precipitate; in the other cases an indistinct reddish precipitate. All these four combinations were diluted with various quantities of water, by which means a decided enough arsenite was formed in all of them.

Not a few other experiments were made; but I shall not add many more, as these remarks have already extended far beyond the length originally contemplated. It may, however, be mentioned, that the effect of the ammoniacal nitrate upon arsenical solution and coffee was greatly improved by dilution; but that in the case of milk and of broth no advantage was observed. The plan alluded to was tried with various mixtures; and in some it occasioned great improvement, and in others little or none. Lastly, it was tried with litmus and Fowler's ague-drop; with the first, on account of its intense colour; and with the last, because Mr Phillips, the proposer of a method of destroying the colour of animal and vegetable liquids, mentions, as a proof of the value of his process, that it enables the silver test to act in its usual way upon Fowler's arsenical solution.

One part of a very deep blue solution of litmus in water was added to the same quantity of solution of arsenic. This combination being put into a tube, the ammoniacal nitrate produced a precipitate which had a green appearance; but when a portion of the liquid was diluted with 12 waters, the test occasioned an undoubted yellow precipitate. The proportion, 1 part arsenical solution, 3 parts solution of litmus, was next subjected to observation. Now the colour of the precipitate could not be specified but by adding water, until the colour was almost removed. The ammoniacal nitrate occasioned a distinct yellow precipitate. A portion of Fowler's solution was put into a watch-glass, with which the ammoniacal nitrate produced a yellowish-red precipitate; in a tube the character of the arsenite was rather better developed. The same test occasioned a good yellow in a watch-glass with the same liquid, after it had been diluted with about 10 waters, and a still better one, upon the addition of 20 volumes of water. In all the cases wherein Fowler's solution was used, the nitrate was found to act less readily than the ammoniuret.

Before concluding, I may observe, that when water is added to a liquid supposed to contain arsenic, the investigation ought to be conducted in a tube, as the experiment upon paper does not appear to be superior or even equal to the more common mode, when the arsenical solution is weak and transparent.

Aberdeen, 24th May 1834.

ART. X.—*Case of Extensive Necrosis of the Os Femoris, in which Amputation was successfully performed.* By DAVID KERR, Esq. Surgeon, Aberdeen.

IN May 1833, I first saw David Milne, the subject of the following memoir, at that time 13 years old. Eight or nine months previous to this date, he had been seized with severe deep-seated pain, and other symptoms of inflammation, a little above the right knee. Soon after the commencement of the disease, the part affected had swelled to a great extent; the inflammation went on to suppuration, and the matter escaped through an opening on the inner side of the thigh, three or four inches above the joint.

From the history of the case, as given by his parents, the disease seemed to have gradually extended up the limb; and when I saw him, the swelling, which was most extensive, not only involved the whole thigh, but had even reached the *pubis* and lower border of the *abdomen;* and a large abscess was ready to burst on the outer side of the limb, immediately below the great trochanter. The thigh was everted, and immoveably fixed at a right angle to the trunk, and the leg and foot highly œdematous. He appeared to be in the last stage of hectic; emaciated in the extreme; pulse feeble and rapid, with profuse night perspirations. On examining the bone through the opening, I found that it was not only exposed, but that there also existed a complete solution of its continuity.

I saw him a second time a few days after, and found that the abscess below the trochanter had burst, and was profusely discharging matter of a fetid and unhealthy nature. He now seemed more exhausted than formerly; pulse ranging from 140 to 150, and extremely feeble. I did not ascertain the state of the bone through the upper opening, as the limb was lying on its outer surface, and could not be moved without greatly aggravating his sufferings.

Owing to circumstances, which it is unnecessary here to mention, I did not see him again till the end of November, when I had occasion to be in the neighbourhood where he resided, and being informed that he was still alive, I paid him a visit. I found him lying in the same position as formerly, (on his back,) to which he had now been confined upwards of fifteen months, wholly unable to move himself. He did not, however, seem so much exhausted as when I last saw him in May. The two fistulous openings were still discharging matter, which was now of a more healthy nature. No change had taken place with respect to the enlargement of the limb, except that it was now of a firmer consistence. The disease could not be ascribed to any cause unless exposure to cold.

On considering the nature and extent of the disease, the difficulty of repairing the breach of structure, and the exhausted state of the constitution, it did not appear to me possible to save the life of the patient without removing the limb; but as this expedient was deemed imprudent by some, who seemed to think that the disease had extended beyond the reach of the knife, a statement of the case was transmitted to Mr Syme of Edinburgh, who entertained no doubt whatever as to the propriety of amputating the limb, not merely as the only means of remedy of which the case admitted, but as one which in all probability would prove successful. To this gentleman I beg leave publickly to return thanks for the kindness and readiness with which he transmitted his opinion, the accuracy of which, with respect to the extent of necrosed bone, was confirmed by the dissection of the thigh.

The hopeless nature of the disease being explained to the patient he not only gave his consent to amputation, but soon became anxious to be relieved from a mass of disease, and from sufferings to which death alone could have otherwise put an end. Various untoward circumstances which took place prevented my operating so early as I could have wished. Soon after he was brought to Aberdeen in January, he had an attack of diarrhœa, attended with an aphthous state of the tongue, which reduced him much. When recovering from this, he caught influenza, then epidemic at Aberdeen, and it was not till the beginning of March that he was in a favourable state for the operation.

On the 7th of this month, assisted by Dr Pirrie, Lecturer on Anatomy to the Universities, and in presence of Dr Davidson, Professor of Natural History in Marischal College, and Mr Campbell, one of the surgeons to the General Dispensary, I amputated the limb. As every drop of blood that could be saved was of paramount importance in this case, it was deemed the safest plan to secure the femoral artery by a ligature immediately below Poupart's ligament as the first step of the operation. In consequence of the diseased and thickened state of the parts through which I had to cut, and the bleeding from several small vessels that took place and obscured my view, this step was more tedious and embarrassing than might have been expected. The vessel being secured, I formed an anterior and posterior flap, and removed the limb by an oblique section of the great trochanter, barely leaving the attachment of the short muscles. Several vessels sprang, but none of them required the application of a ligature. The flaps were secured towards each extremity by a single stitch, and supported in the middle by three slips of adhesive plaster, which completed the dressing. The temperature of the stump was afterwards regulated by the application of cold water. The quantity of blood lost during the operation did not exceed four or five ounces; and to this circumstance the success of the operation is in a great measure to be ascribed.

Although a partial union by adhesion only took place, the effects produced by the removal of so great a source of irritation were highly gratifying, and far surpassed my most sanguine expectation. The consecutive fever and suppuration which ensued were much less than might have been expected. He was somewhat restless during the early part of the first and second night, but it could not be said that he passed a single bad night, and on the second day after the operation his appetite was completely re-established, and he slept nine or ten hours with little or no intermission. During the time he remained in town his sleep and appetite continued such as might have been expected in one who had been long deprived of these enjoyments. But the effects produced on his sleep and appetite were not more remarkable than those which naturally followed them. Instead of a countenance meagre, contracted, and care-worn, he began to assume characters of an opposite nature. He daily increased in flesh and strength,—his features began to expand,—and he assumed an air of cheerfulness and tranquillity to which he had long been a stranger.

As soon as healthy granulations sprung up, the sides of the wound were gradually brought together by slips of adhesive plaster, lint being applied to the surface of the sore to absorb the matter. The contracting process went on rapidly. The ligature separated from the femoral artery on the 23d day, and on the 25th April he was sent to the country with the wound all but whole.

Dissection of the Limb.—The subcutaneous cellular tissue and muscular interstices were greatly loaded with adipose matter. The muscles, as was to be expected, were much wasted. The *sequestrum*, which embraced the whole thickness of the shaft of the *femur*, except at its upper extremity, was seven inches in length, extending from a little above the condyles almost to the trochanters. A considerable quantity of new osseous matter was deposited around the dead bone, but in such a manner that the *sequestrum* was not completely enveloped by it. Anteriorly and posteriorly the union was complete, so that a continuous shaft was formed. On the outer and inner side there was a considerable deficiency, the *sequestrum* being turned obliquely,—the upper extremity projecting inwards, while the lower was turned in the opposite direction; and to these projections corresponded the deficiencies in the new bone. This circumstance we must regard as a wise provision of nature in her endeavours to throw off the *sequestrum*,—the imprisonment of which within a complete osseous shell would have formed an insurmountable barrier to its escape.

There was another circumstance which particularly attracted my attention. On laying open the knee-joint, and cutting away the articulating cartilages, which appeared healthy, I found the whole cancellated structure of the head of the *tibia* and condyles of the *femur* converted into a soft reddish-looking mass, which at first I took for a scrofulous degeneration; but finding that it not only extended through the whole of the *tibia* and *fibula*,—the only part of these bones that remained being a thin external shell, which also appeared to a considerable extent deprived of its earthy matter,—but that the neck of the *femur* where it was divided was in a similar condition, I was obliged to come to a different conclusion, especially as the cartilages of the knee were sound, which I do not think could have been the case in a scrofulous affection involving the whole limb, nor do I think that the wound could have healed up so kindly over a bone that was actually diseased.

The only way, then, in which I can account for the softening of the bones is by supposing either that the absorbents had robbed them of their earthy matter, in order to supply the secerning vessels of the thigh with materials for the formation of the new bone, or, which appears to me more in accordance with the laws of the animal economy, that the vessels had, as it were by a sort of organic intelligence, (if I may be allowed the expression,) concentrated their whole power on the thigh, while they neglected the rest of the limb, the absorbents at the same time acting with their wonted energy, and depriving the bones of their earthy matter, which not being supplied, produced the appearance above described. Similar examples might be adduced where one function of the body is unusually active, while another that is supplemental to it is diminished in a corresponding degree, or where one part is preternaturally developed at the expense of another. I do not recollect having read of a similar occurrence, and I am not aware that softening of the bones of an extremity is taken notice of by any writer as a consequence of necrosis, and whether it be one that universally obtains, future observation alone can determine.

I cannot conclude this report without expressing my obligations and thanks to Dr Davidson of Marischal College, for the deep interest he took in the case,—for his kindness and readiness in forwarding my views regarding it,—and for his valuable suggestions concerning the management of the case, more especially as regarded the after-treatment.

I saw Milne ten days ago, and I have much pleasure in being able to state that his improvement, since he went to the country, has been uniform and progressive.

Aberdeen, May 18, 1834.

Art. XI.—*Case in which an Ear of Grass impacted in a Bronchial Tube gave rise to the symptoms of intense Bronchial Inflammation.* By William Donaldson, M. D. Ayr.

Miss E. F., æt. 11, on the 7th August, complained of cough and exceedingly deranged stomach and bowels, with very fœtid breath. She got two or three doses of medicine, (senna and salts,) as nothing else than a deranged stomach was apprehended. About the 4th of September she was seized with violent vomiting, of green bilious-looking matter, with much cough, and purulent expectoration so fœtid that the smell was almost insufferable; but without any fever or symptoms of inflammation. She got medicine, which produced most offensive stools.

The cough still continuing, although there was no pain in the chest, a blister was applied; this discharged freely. About this time the pulse rose to 100. The cough continuing the blister was reapplied. She complained *now* of some pain under the blistered part, which she described as some rough substance passing up and down under the *sternum;* for this leeches were applied. On Thursday the 19th September, she had a violent fit of coughing, when she brought up a head of grass *(Cynosurus cristatus.)*

From this time she felt easier, and the expectoration became less fœtid. The cough still continuing, the blister was again applied, and as it began to discharge the cough abated, and the expectoration lost its fetor. In a week after the cough and expectoration were nearly gone. She was able to leave her room, and has continued to recover strength rapidly.

It appears (for it was concealed at the time) that, about the 1st of August, having some grass in her mouth, she was seized with a fit of coughing which almost choked her, when of course it must have got down. But this circumstance was never mentioned to any of the family, or the medical attendant, till it came up. There never was appearance of blood with expectoration but once.

The above case is very curious and interesting in many respects. The rough substance must have stuck either in the windpipe or in one of the middle-sized bronchial tubes. It did not seem to have lodged behind the palate, because the patient never complained of sore throat, or of any unpleasant feeling there.

I send you the case, with the head of grass as it was discharged, as I am not aware of any case so remarkable on record.

Annotation on the above Case, by David Craigie, M. D., F. R. S. E., Physician to the Royal Infirmary.

Though no case in which an ear of grass impacted in the windpipe or a bronchial tube, and giving rise to symptoms of acute bronchial inflammation, may be on record, there are many examples of different species of foreign bodies which had slipped through the *glottis*, and which had subsequently given rise to all the symptoms of *bronchitis* or peripneumony, first acute, then chronic, and even symptoms which were mistaken for those of *phthisis pulmonalis*. Some of the most remarkable of these cases are the following.

1. Dr Lettsom mentions a case in which the foil or covering of a button had dropped into the windpipe of a boy in October 1783, and remained there the whole winter. It gave rise to urgent cough, hoarseness, difficult breathing, expectoration of dense mucus, quick pulse, night-sweats, and wasting of the flesh and strength. It was eventually coughed up after a lapse of seven or eight months, and the symptoms of bronchial and pulmonary disease subsided. *

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* Memoirs of the Life and Writings of the Late J. C. Lettsom, M. D., by T. J. Pettigrew, F. L. S. Lond. 1817. Vol. iii. p. 82.

2. Dr Mervin Nooth relates of himself, that he laboured for many months, first under a sense of weight and fulness in the left side of the breast, with some difficulty of breathing, then urgent cough, expectoration of dense mucus, constant, quick, and irregular pulse, and much anxiety and pectoral distress; and, at length, after all remedial means had been tried in vain, coughed up a leaden shot about one-eighth of an inch in diameter, with very speedy alleviation of all the painful symptoms.* He afterwards recollected, that one day after drinking the last glass of a bottle of wine, he was immediately seized with a convulsive cough, which at the time he attributed to some drops of the liquor passing into the *larynx*, but which he then was satisfied must have been the leaden shot, which its weight in this manner carried into the windpipe, and lodged probably in one of the middle-sized bronchial tubes.

3. Another case is given by Mr Howship of the same train of symptoms being produced by a nail which had slipped into the *trachea*.

"James Butler, aged 65, employed by Chippendale, of St Martin's Lane, was working in the repair of an ornamental ceiling. He had two nails in his mouth, and while looking upward at his work, a little irritation set him coughing, when one of the nails was thrown out of his mouth, and the other, in recovering his breath, to use his own words, 'slipt down his windpipe.'

"Incessant irritation, pain, and cough, directly followed, and so continued till the man was worn away to a skeleton; spitting up blood, and mucous phlegm.

"All the Faculty who were consulted pronounced his case hopeless; and if rightly represented, (in themselves convinced, that had such an occurrence taken place, it must quickly have proved fatal,) assured him it went down into the stomach, and must have passed off through the bowels. They said that what he experienced arose from the irritation it produced when in the stomach, but that it was not in his lungs as he imagined, or suspected.

"Dr Pitcairn, Mr Cruickshanks, and others saw him. Mr K. of St Martin's Lane, was with him directly after it happened. Prescriptions mitigated his sufferings a little, but could not remove them. The pain and all his complaints were fixed in the right lobe of the lungs, and he could then, as at the first instant after the accident, cover the exact spot with his hand. Spitting of blood continued to recur at intervals, and the poor fellow was consigned to certain death.

"This lasted from the 15th of April to the 12th of August following, when, after a copious spitting of blood, with a sudden fit of coughing, he threw up something with violence towards his teeth, against the roof of his mouth, mixed with blood. Perceiving it a hard substance, and ever having the nail in his mind, he spit into his hand, and found it to be the identical nail that had slipt down the trachea so long before. The head of the nail was rusty when thrown up.

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* Transactions of a Society, &c. Vol. iii. p. 1. Lond. 1812.

"April 1815. Eleven or twelve years have elapsed since this event took place, and the man has enjoyed pretty good health; subject, however, to occasional cough, slight spitting of blood, and a painful sensation, precisely in the old spot."*

4. When conversing with Dr Abercrombie regarding the case communicated by Dr Donaldson, and referring to those now mentioned, he informed me, that he and Dr Maclagan had some years ago met with a case in many respects similar, in which the foreign body had been an artificial tooth.

The patient was a lady of middle age, who had an artificial tooth pivoted, as the dentists term it, upon the stump or root of a natural tooth. In the act of masticating a bit of oat-cake one evening in October 1821, this had been detached from its position and swept into the throat in an unusually strong inspiration. Much irritation of the *larynx*, with gasping, cough, and difficult breathing, recurring in fits, were the consequence; and after the urgency of these symptoms subsided, frequent harassing cough, with dense mucous expectoration, quick pulse, uneasiness in the breast, and other symptoms of *bronchitis* ensued, and continued for several months. The treatment was directed chiefly to obviate and abate the bronchial inflammation, and to palliate the symptoms of laryngeal and tracheal irritation; and the patient continued long in a doubtful state.

At length, after much suffering, and when the bronchial disease had passed into a chronic state, the artificial tooth was coughed up by expectoration on the morning of Sunday the 23d May 1824, after the lapse of two years and seven months from its descent into the windpipe. Much relief then ensued in the breathing and sense of stifling and weight in the chest; the cough became less frequent and urgent; the pulse fell; and the patient recovered some degree of her previous health and strength. She continued, however, to cough and expectorate dense mucus; and, being very susceptible of bronchial attacks, she caught cold in July 1824, and spit up some blood in August. In the latter part of 1824, the bronchial symptoms assumed a greater degree of intensity; and, after much distress from cough and expectoration, she died on the 1st February 1825.

In this case Dr Abercrombie entertains no doubt, he informs me, that the artificial tooth had stuck in one of the middle-sized bronchial tubes. After passing the *glottis* it could readily get down the *trachea ;* but it could not easily pass into the smaller sized tubes.

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* Practical Observations in Surgery and Morbid Anatomy, &c. By John Howship, p. 222. Lond. 1816.

The case given by Dr Houston of a real tooth slipping down the *larynx*, which shall be given in a subsequent division of this annotation, affords an interesting necroscopic comment on the case of Dr Abercrombie.

5. Dr Abercrombie informed me at the same time, that he had seen, along with Dr John Scott of this city, a case in which there was reason to believe, from the history and circumstances of the case, that a foreign body impacted in one of the bronchial tubes was giving rise to a train of symptoms of the same character. Of this case I was favoured with the leading circumstances by the kindness of Dr Scott.

" H. S., nearly 4 years of age, about six weeks ago, while his sister was eating a walnut, requested a piece of it. She put something into his mouth, but whether it was a portion of the nut or the shell could not be learned from her. The circumstance was followed by immediate violent coughing, which continued to recur in fits of from three to four hours' duration.

" When I saw him about two days after the accident, I recognized, with general distress, anxious breathing and feverishness, absence of respiration in the right lung, puerile respiration in the left, and some sonorous rattle in the right bronchial tube. Next day, though the febrile symptoms were abated, the fits of coughing were repeated and violent, with intense sonorous rattle in the right bronchial divisions.

" Since that time with the sonorous rattle, the cough has been more croupy than bronchial, with expectoration of dense opaque puriform mucus, and occasional exacerbation of all the febrile symptoms. The fits of coughing are most frequent and severe in the night and morning, and are trifling during the day. The pulse keeps at about 140, and there is considerable wasting of flesh and strength, but without night-sweats. The symptoms occasionally exhibit intervals of alleviation ; and some days he is comparatively easy. During the nights, also, the symptoms are liable to vary in intensity ; and while he spends some nights in comparative ease, others are attended with high and very rapid breathing, much increase of heat, pectoral distress, and general fever, with more frequent and violent fits of coughing."

In this case Dr Scott remarks, that though we have only circumstantial evidence, there is, nevertheless, very strong reason to believe that all the symptoms depend on bronchial inflammation, induced and maintained by the presence of a foreign body in one of the bronchial tubes.

6. To the valuable case of Dr Gilroy, recorded in the thirty-fifth volume of this Journal, it is merely requisite to refer the readers.

That case is peculiar in showing that a foreign body of a peculiar mechanical configuration may give rise not only to bronchial inflammation, but to *pneumonia* and abscess of the lungs. The chicken bone, nevertheless, lay in the usual situation, the upper part of the right *bronchus*.

7. In the thirteenth number of the Dublin Journal of Medical and Chemical Science, Dr Evanson gives the particulars of a case, in an infant of one year and one month, in which the presence, in all probability, of a herring bone in the *trachea* or upper division of the bronchial tubes, gave rise to symptoms not only of *bronchitis* of the right lung, but of croup and urgent suffocation. The cough in this case was harassing and teasing, and occasionally very severe. The difficult breathing was most intense and conspicuous during inspiration; the voice was hoarse, and occasionally stridulous; the surface was hot, and the pulse rapid; and there was much general uneasiness and restlessness. This was the state of symptoms on Tuesday, the fourth day after it was believed a portion of herring bone had been allowed to slip into the *larynx*.

After the employment of antiphlogistic remedies, as leeches to the throat, purging by means of jalap and calomel, and the use of a solution of tartrate of antimony, without alleviation of the bronchitic symptoms, Mr Crampton performed the operation of tracheotomy, by removing a small slip of the *trachea*, yet without finding or extracting any foreign body. Next day, however, the symptoms of suffocation were less urgent; and though the respiration continued laborious, stridulous, wheezing, and at rate of 70 in the minute, with a copious secretion of thick mucus in the *trachea*, in the course of a few days these symptoms diminished in intensity, and the discharge became less abundant.

As the improvement proceeded, the wound was allowed to heal and become closed; and though the cough remained, and the voice continued hoarse and faint for months, it at length became natural, clear, full, and loud; while the cicatrix of the wound was so much contracted as to become hardly perceptible.

Though in this case no foreign body was found at the time of operation, it appears that the mother confessed, that, on the fourth night after the operation, when she was removing from the wound the viscid mucus which had collected, she felt something hard sticking in the sponge. A projecting point now began to appear whenever the child coughed; and the direction of this body seemed to be from the upper part and side of the wound. This circumstance, however, she concealed from the attendants, from the apprehension, she stated, of further operation; and before morning it projected so much that she attempted its removal herself, and after some force, and the discharge of a little bloody matter, effected her purpose. The body thus removed was sharp, and looked like a portion of herring bone, but somewhat softened, and of a greenish colour. These qualities, however, it lost in drying; and when presented to Dr Evanson, it had the appearance of a bone of herring or some similar small fish, though rather less firm than natural.

Dr Evanson admits that in this case the evidence of the bone having been within the windpipe is less complete than could be desired, since it rests solely on the veracity of the mother. But he observes, in confirmation of the general accuracy of her statement, that while she dwelt much on the manifest and decided alleviation which the symptoms underwent in the course of the day, after this piece of bone was represented to have been removed from the wound and the interior of the windpipe, the report of the case as kept by Mr Hamilton, who knew nothing of the woman's story, and remains, Dr Evanson believes, still incredulous, shows distinctly, that on the same day a great alleviation took place, and continued to proceed.

8. In the same number of the same journal, Dr Houston, surgeon to the New Hospital in Baggot Street, details a very interesting and melancholy case, to which the same objection of deficient evidence does not apply. Of this case I shall give an abridged account.

John Clare, aged 29, in the condition of a servant, of temperate habits and sound constitution, had occasion to have the second molar tooth of the right upper jaw extracted in May 1830. On the first application of the tooth key, part of the crown was chipped off, and removed from the mouth by the operator. By a second attempt the tooth was started from its socket, but on being loosened from the claw of the instrument, it slipped down the throat, and was not afterwards seen either by patient or operator.

About four hours after, the patient called on Dr Houston, and presenting the upper fragment, with the statement now given, informed Dr Houston that he felt, after the extraction was completed, a momentary sharp pricking pain at the top of the windpipe, followed by a severe fit of coughing, which soon went off, but recurred again several times without evident cause, and at each time with abated severity, until after a few hours it ceased to produce annoyance. He complained, however, of a feeling of undefinable uneasiness in the chest; a sensation of weight in breathing; and a tendency to draw heavy sighs, which kept his mind in a state of continued inquietude. Occasionally, and at irregular intervals, he coughed up a little frothy mucus, untinged with blood or purulent matter. He had not, previous to the accident, been subject to any cough or other affection of the chest; and all these symptoms both the dentist and himself agreed in ascribing to the passage of the tooth down the throat.

In a consultation held twenty-four hours after the accident, the following stethoscopic signs were recognized.

"There was a mucous rattle in the lower part of the trachea, audible even to the naked ear, but very distinct when heard through the stethoscope. Both sides of the chest gave a perfectly and equally clear sound on percussion; but notwithstanding their similarity in this respect, there was a marked difference in the intensity of the respiratory murmur—the sound of the air entering into, and expanding the right lung, being obviously more feeble than that heard at the same moment in the left. There was, likewise, under the right clavicle a slight sonorous *rale*, a deviation from the natural sound of breathing not discoverable in any part of the left lung. These signs were fixed and not modified or removed by any alteration in the position of the body; nor by causing the patient to expire with violence, or to take a full breath."

It is unnecessary to give the conflicting opinions entertained as to the presence or not of a foreign body in the windpipe. The man was placed in the hospital; and after passing successively through the several stages of *bronchitis*, *pneumonia*, and *pleurisy*, first of the right, and then of the left lung, expired on the eleventh day after the accident. Upon inspecting the body sixteen hours after death, the following was the state of the organs of the chest.

The lungs on both sides presented their natural fulness, without collapse on either side. The right lung adhered to the *pleura costalis* every where, except behind, where a quantity of thin bloody fluid lay between the *pleuræ*. The left lung adhered by universal adhesion. The lymph, interposed between the pulmonary and costal *pleuræ* on the right side, was considerable in quantity, firm, and opaque, and evidently of several days' duration; that in the posterior region of the chest especially was, for a space of seven or eight inches, abundant and tenacious. The lymph forming the adhesions on the left side was smaller in quantity, and presented the appearance of a thin semigelatinous layer. All the adhesions were soft and easily broken; and when removed, the pulmonary pleura was seen very red and vascular, and on the right side livid.

The substance of the right lung was dense and indurated in every point; its tissue, nevertheless, readily gave way under the finger; and sections exposed surfaces discharging much dark fluid blood and serum. The substance of the left lung was less heavy and engorged, but exhibited marks of intense inflammation.

Upon slitting open the windpipe from the *larynx* to the lung, the tooth was found lying in the right bronchial tube about one inch beyond its commencement, with the fangs directed towards the lung, and the broken surface of the crown towards the *larynx*. It lay loose or unattached, and was readily removed when caught between the points of the scissors. The broken surface fitted accurately to that of the crown, as presented to Dr Houston by the patient.

The mucous membrane of the air-passages, from the *larynx* to the smallest branches of the bronchial tubes in both lungs was swelled, softened, and of a deep red colour, as if minutely injected; and the bronchial tubes were filled by muco-purulent fluid round the tooth, but without abscess or breach of surface in the vicinity of the spot where it was lodged.

I have given the foregoing cases, the number of which might have been much enlarged, for the purpose of showing, that symptoms of intense bronchial inflammation, first acute and then chronic, often simulating pulmonary consumption, and even symptoms of intense peripneumony, may be induced in this manner, and may continue until the foreign body is expelled from the cavity of the bronchial tube or *trachea.*

These cases further show, that the presence of such bodies is not necessarily followed either by ulceration or abscess of the parts with which they are in contact, and that, however intense and alarming the symptoms may appear, they depend chiefly on inflammation of the bronchial membrane, more or less acute, and more or less intense and enduring. The case of Dr Gilroy is the only one in which abscess with breach of substance of the lung took place.

In all these cases it may be pretty confidently inferred from the one given by Dr Houston, that the foreign body does not pass beyond the middle-sized bronchial divisions. To its further descent, indeed, there is at once an anatomical and a physical impossibility;—anatomical, in so far as the calibre of the small bronchial tubes will not admit of further introduction;—and physical, in so far as the size and figure of the body in general will cause it to stop in the upper ramification.

It is further pretty evident that these bodies descend into the right bronchial tube in preference to the left, because it is more in continuation with the *trachea* than the left *bronchus.*

Dr Houston seems to imagine, that, in the interesting case which he has published, the weight of the tooth operated as a great and almost insurmountable impediment to its expulsion by coughing. But when we remember that the leaden shot inspired by Dr Mervin Nooth, and the iron nail inspired by James Butler, were both expelled after a long period by coughing, it is hardly possible to admit, that this should form a difficulty to the ejection of a tooth, which is certainly lighter than either a leaden shot, or an iron nail of the same bulk. The mechanical configuration of the bodies seems to constitute the most serious difficulty to their ejection by coughing.

For some observations on the propriety of performing tracheotomy in these accidents, I may refer to the paper of Dr Browne, published in the 35th volume of this Journal.

PART II.

CRITICAL ANALYSIS.

ART. I.—1. *Caroli Francisci Bellingeri F. S. Agatha Derthonensi, Phil. et Med. Doct. Amplissimi Med. Collegii Candidati Dissert. Inauguralis quam Publice defendebat, in Athenæo Regio Anno* MDCCCXVIII. *die ix. Maii hora ix. matutina.* Augustæ Taurinorum Excud. Joseph Favale. 8vo. Pp. 337. *Ex Anatome; De Nervis Faciei, Ex Physiologia; Quinti et Septimi Paris Functiones. Ex Medecina Theorica; De Neuralgia Faciei. Ex Praxi; Cura Neuralgiæ Faciei. Ex Materia Medica; Specimen de Remediis Nervinis.*
2. *C. F. Bellingeri De Medulla Spinali.* Turini, 4to., 1823.
3. *Ragionamenti, Sperienze ed Osservazione Patologiche comprovanti l'Antagonismo Nervoso, esposti e Raccolte da Carlo Francisco Bellingeri, Medico Della Real Corte Pel Solo Titolo, Preside della Facolta Medica Nella R. Universita, &c.* Torino, 1833, 8vo. pp. 397.

To those who take interest in the progress of physiological science, it is well known that during the last twelve or fourteen years, much light has been thrown upon the properties and functions of the nervous system, by the experimental researches and inquiries of several distinguished physiologists in this country and in France. Among the facts established, the new views unfolded, the obscurities cleared up, and the intricacies unravelled, perhaps none is more interesting and important than that which may be now admitted to prove, that distinct orders of nerves are subservient to the functions of motion and of sensation. They tend not only to explain anomalies, reconcile discrepancies, and elucidate difficulties, but they have placed the physiologist and pathologist on a new train of observation, and have enabled both classes of inquirers to conduct their investigations in a clearer and more satisfactory manner than heretofore.

Though this important distinction of the difference between nerves of motion and nerves of sensation was known to Galen, and more or less distinctly suspected or expressed by many of the modern anatomists and physiologists, it is well known that the merit of placing it in a conspicuous light before the physiologists of the present day, has been partly claimed by Sir Charles Bell and M. Magendie, and is partly divided between these eminent persons. Sir Charles Bell, indeed, informs us that he had demonstrated experimentally in 1811, in his unpublished tract containing the *Idea of a New Anatomy of the Brain*, that "the posterior *fasciculus* of spinal nerves might be detached from its origin without convulsing the muscles of the back;" whereas, "that on touching the anterior *fasciculus* with the point of the knife, these muscles were immediately convulsed;" and both he and his pupil, and assistant, Mr John Shaw, appear to have conducted their inquiries and explained their doctrines of the functions of the nervous system on this principle for several years. We do not conceive, however, that it is doing any injustice to Sir Charles Bell to say, that he does not appear to have been fully aware of the exact nature of the distinction thus indicated or of its important tendency for several years after he had announced it; and, at all events, while he inferred that the anterior and posterior *fasciculus* were distinct in physiological properties and in anatomical origin, he attributed to the anterior both sensation and motion, and to the posterior those organic properties which modify the growth and circulation of parts. It was, indeed, only in 1821, that Sir Charles Bell began to form a distinct opinion of the separate characters of nerves of motion from nerves of sensation, and to apply this distinction in investigating and explaining the peculiar functions of the fifth and seventh pairs of nerves as nerves of the head and face.

In that paper, which was read to the Royal Society on the 12th of July 1821, Sir Charles Bell undertook to establish the principle, that of the two nervous trunks distributed to the face, viz. the *trigeminus* or fifth cerebral nerve, and the *portio dura* of the seventh or the lateral facial nerve, the former presides over the sensations or common sensibility of the head and face, and wherever it is injured or destroyed, sensibility undergoes proportional diminution or abolition; that it, nevertheless, possesses muscular branches for the purpose of mastication; whereas the latter nerve regulates the muscular motions of the lips, nostrils, and *velum palati*, and especially when in connection or associated action with the motions of respiration; and that every paralytic affection of the muscles of the face may be traced to some disorder or injury of the *portio dura* of the seventh pair.

Without adopting all the inferences which Sir Charles Bell conceived himself justified in drawing regarding the influence of the seventh pair on the motions of respiration, Magendie conceded the point, that the English physiologist was entitled to the merit of showing experimentally, that the fifth cerebral nerve is a nerve of sensation and sensibility, and that the motions of the face are dependent on the *portio dura* of the seventh cerebral nerves. In making this concession, however, the French physiologist denied that any general distinction had been taught or established previous to his own time between nerves intended for sensation, and nerves intended for motion; and maintained, that he was the first who demonstrated experimentally the fact of this distinction, and showed, that of the double row of nervous roots issuing in parallel lines from the lateral regions of the spinal chord, the anterior are destined for motions, and the posterior for sensation.

In other respects, several of the most characteristic doctrines of Sir Charles Bell have failed to be established by other inquirers. Thus not only have his principles regarding the connection alleged to subsist between the seventh pair and the associated motions of respiration, or what he termed the instinctive motion of the face, been contradicted by the experiments of Fodere and Mayo, but his inferences regarding the fifth pair being a nerve of sensation and voluntary motion jointly, have required to be rectified and modified by the results of the experiments of the latter inquirer.

Mr Mayo showed, by dividing in the ass the firm portion of the seventh pair, not on one side but on both, that this nerve presides over simple voluntary motion only; and by dividing similarly the second and third branches of the fifth, at their points of emergence in another animal of the same genus, he showed that the lips were deprived of sensation, but not of motion.

In the subsequent prosecution of the inquiry, Mr Mayo, partly by dissection, partly by reasoning, and partly by experiment, observing that the masseter muscle, the temporal, the two pterygoids, and the *circumflexus palati* receive no branches from any nerve except the fifth, and yet receive branches from the ganglionic portion of that nerve, arrived at the conclusion, that almost all the branches of the large or ganglionic portion of the fifth are nerves of sensation, while those of the small *fasciculus* or ganglionless portion are nerves of motion.

Meanwhile Sir Charles Bell, in a paper communicated to the Royal Society in May 1829, illustrated at greater length this doctrine regarding the compound character of the fifth pair. By the anatomical distribution of that nerve, by experiments on its trunk, and by the effects of injury and disease, he inferred that its motive or ganglionless portion, which is distributed not only to the masseter, temporal and pterygoids, but to the buccinator, is not only a nerve of manducation, to close the jaw, and give it its lateral or grinding motion, but that it is a nerve of prehension, to place the morsel under the influence of the cheeks and teeth, and also that it supplies the muscles for opening the jaw,—and all this because it was requisite that the actions of mastication and prehension of the food, as well as sensation, ought to be in association or concert.

We do not propose to enter minutely into the consideration of the absolute soundness of all these doctrines, which, upon a former occasion, we brought so fully before the attention of our readers, that it is unnecessary now to resume the examination of the subject in that light. Much less do we think of investigating the justice of those opinions promulgated by Sir Charles Bell regarding the connection of the facial motive nerves with the organs of respiration. But we propose, in giving some account of the inquiries of the learned foreigner whose writings are enumerated at the head of this article, to consider the doctrines taught on the fifth and seventh nerves by that physician several years before the time at which Sir Charles Bell published, and to see to what extent they agree or differ from those inculcated by the latter author. It is a remarkable fact that, five years at least before Sir Charles Bell communicated to the Royal Society of London his peculiar doctrines on the uses of the fifth and seventh pairs of nerves, Bellingeri had published a most minute and elaborate view of the anatomical distribution and physiological uses of these nerves, and on many of the most important points of the latter department had anticipated the British physiologist. That this circumstance has not been known to English physiologists at an earlier period is not wonderful, when we consider how indifferent the profession at large are to the elaborate and elegant productions of the anatomists and physiologists of the transalpine peninsula; and how few even of those who pretend to keep pace with the medical literature of the continent extend their studies beyond the productions of France. Something also must be attributed to the slow progress and difficult transmission of Italian works into this tramontane region; since, unless under particular circumstances, a work of much value and interest may be published in Italy for fifteen or twenty years, and yet be almost unknown in Great Britain. The treatise to which we allude was published at Turin in 1818. Yet we believe it has never hitherto been noticed in any way by any English author.

It is necessary, in the meanwhile, to premise a few observations on the nature of the treatise which contains the doctrines now specified. Though denominated an Inaugural Dissertation, that treatise must not be confounded with the usual run of these productions, nor must it be considered as of that class of literary performances. An inaugural dissertation indeed it is; but not in the sense understood in this country. In several of the Italian states there exists a custom of promoting a candidate for professional distinction and honours, first to a degree as an academical title; and then, as this title conveys no privilege to undertake the care of patients, of promoting him, after further proof of elementary and practical knowledge, to the rank of a fellow or licentiate of the Local College. In the latter ordeal, which is much more serious and lengthened, it is understood that the candidate shall give proof not only of accurate knowledge of some subject in the elementary sciences of medicine, but of considerable clinical experience and knowledge in the practical applications of the art. In this ordeal, therefore, not only does he undergo strict personal examination, but he must by writing, give proof of a respectable degree at least of acquaintance with the literary and scientific history of some interesting and important branch of medicine or surgery. It is under such a system that the names of Scarpa, Caldani, Palletta, Jacobi, Brera, Martini, Speranza, Buffalini, and the present author have acquired distinction; and as the Italian universities and their professors have not yet made the discovery, that Valsalva and Santorini, Morgagni, Fontana and Spallanzani, Haller, Zinn, and Meckel, and all their great and eminent preceptors had lived in vain, and consequently have been unable to discard entirely the literary history of the sciences which they profess to teach, the writings thus produced evince a much more thorough acquaintance with the literature of anatomy, physiology, and pathology, than those of any other European nation. No one in that country undertakes to instruct his professional brethren without making himself perfectly acquainted with every thing that has been already accomplished on the subject; and as all of them are previously systematically imbued with the leading facts of the literary history of their art, minute and intimate acquaintance with one department becomes a matter of comparative facility. It is thus that the medical writers of the Italian states produce invariably much more learned and classical treatises than those of any other country, and that their writings present a much clearer and more logical method of arrangement, and breathe a more philosophical spirit than those of either France or England.

Of the qualities now specified, the treatises before us, and especially that first named, are very happy examples. It consists of six parts or divisions, each devoted to a subject in physics, anatomy, physiology, theory of medicine or pathology, practice or therapeutics, and materia medica. With the first, which is devoted to the elaborate examination of the physico-chemical properties of albumen, and which is not immediately connected with the present subject, we shall not interfere. To the second and third, devoted respectively to the anatomical history and physiological theory of the uses of the nerves of the face, we propose to request the attention of our readers more particularly and closely. The three latter divisions of the dissertation on *Neuralgia* of the face, its treatment, and the employment of remedies reputed antinervous, it is not probable that we shall have space at present to consider with any justice; but we shall on some future occasion perhaps advert to their most important contents. After these explanations, we may proceed to bring before our readers the principal facts, anatomical and physiological, enumerated by Bellingeri in the present essay.

M. Bellingeri begins his inquiry with a learned and elaborate account of the origin, composition, and course and distribution of the fifth pair of nerves, or the trifacial of Chaussier.

In describing the origin of the nerve, he appears to follow chiefly Santorini, Girardi, and Soemmering, in representing it to issue by two roots from the peduncles or *crura* of the *cerebellum*, and from the olivary eminences; and though the nascent fibres are collected from the different points to form a single trunk, yet this consists of two *fasciculi* from the point of issue from the substance of the brain. This twofold composition of the origin of the nerve, though known by Willis and Vieussens, was first well delineated by Scarpa, and was particularly described by Palletta in his account of the nerves of the temporal and buccinator muscles. Of these two component *fasciculi*, one, which is anterior and superior in origin, is the smaller of the two; the other, which is posterior and inferior, is the larger, which corresponds properly to the trunk of the fifth pair. They are separated from each other either by filamentous tissue, by blood-vessels, or by a medullary lamina; and each consists of numerous distinct filaments.

The larger division of the fifth, on emerging from the peduncles of the brain, assumes the aspect of a tubercle or medullary *papilla*, much softer than the trunk, and which was first accurately described by Bichat. To this papillary eminence the nervous filaments adhere on all sides, and are so distinct that Wrisberg counted in it from thirty-four to forty-five and fifty filaments. They vary in thickness from their origin to the semilunar plexus, and do not proceed in a direction parallel to each other, but are interwoven variously and connected by other nervous fibres proceeding transversely, as has been accurately observed, and faithfully represented, by Prochaska in the fourth and fifth figures of his second engraving.

These filaments, however, are speedily collected into a single *fasciculus*, which, enveloped in *pia mater*, with the smaller portion here placed below it, is conveyed to the sides of the posterior clinoid process, and received in a peculiar furrow formed by the *dura mater*, entirely separate from the cavernous sinus, as has been shown by Meckel, in opposition to Vieussens and Winslow, and there it constitutes a *plexus*, which from its shape has been denominated semilunar, while the trunk itself is augmented at least sixfold. This *plexus*, which is surrounded by very dense cellular tissue, to which Malacarne applied the name of a bracelet *(armilla,)* and was shown by Haller to abound in blood-vessels, M. Bellingeri contends, was very improperly named by Hirsch the *Gasserian ganglion*, in memory of his preceptor, since it is not a genuine ganglion; and the filaments, though much intermixed, are not so much confused that they cannot be traced, as has been actually done by Palletta and Wrisberg; but though in external aspect it resembles the ganglions, in internal arrangement it is a plexus.

On the question proposed by anatomists, whether nervous filaments proceed from the semilunar plexus or the branches of the fifth pair to the *dura mater*, Bellingeri agrees with Wrisberg and Malacarne in thinking, that the filaments regarded as nervous are mere cellular tissue or blood-vessels.

After forming the semilunar plexus, the trunk of the fifth pair is parted, like the foot of a bird, into three branches unequal in thickness,—one anterior and small, the *Ophthalmic* of Willis; another intermediate in size and position; and a third, which is posterior and the largest, constitute the two nerves named by Winslow *Superior* and *Inferior* maxillary.

It is neither our intention, nor is this the proper place, to follow the learned author in his minute and accurate description of the course, divisions, and final distribution of these three branches. It is sufficient to say, that Bellingeri, after a minute and elaborate survey of them, shows, that the internal structure of the ophthalmic nerve has a plexiform character, is of an ash-gray colour, and appears to be, as Bichat accurately observes, a direct continuation of the semilunar plexus. He shows, nevertheless, that there is in the cavernous sinus no communication by nervous filaments between it and the origin of the intercostal nerve, as has been generally, but erroneously, taught by many anatomists; but admits with Willis, Camper, Malacarne, and Chaussier, an anastomotic communication with the sixth pair and the intercostal at the point where the ophthalmic issuing from its own canal unites with the sixth. He then traces this branch into three subdivisions, which enter the orbit separately by the sphenoidal fissure, and of which the largest, upper, and most external is the *frontal or superciliary* nerve, and seems a continuation of the trunk; the external and smallest is the *lacrymal;* and the lower, which is middle in point of size, is the *nasal*, or *naso-ocular.*

Of these three branches, the author shows that the first only sends some of its filaments to such muscles as the *orbicularis palpebrarum*, the *superciliaris*, and the frontal muscle; while in these they seem chiefly to act as sensitive organs. Of the other two, the lacrymal is principally expended on the lacrymal gland, with the exception of a few filaments, which maintain a nervous communication with that organ and the deep temporal nerve, the facial nerve, and the *levator palpebræ superioris.*

The nasal, or what is termed more properly by Soemmering the naso-ocular, after sending a large branch to form with the third pair the ophthalmic ciliary or lenticular ganglion, is principally ramified in the membrane of the ethmoid cells and the mucous membrane of the nostrils, as far as the *apex* of the nose.

It is important, Bellingeri reminds us, to observe, that all the nerves of the face, but especially the most minute branches of the fifth pair, are every where accompanied by a very small artery, which merely runs along their investing membrane.

The *superior* maxillary nerve issuing, as already stated, from the middle of the semilunar plexus, and emerging from the cranium by the *foramen rotundum* of the sphenoid bone, after sending a communicating filament to the lacrymal and two molar and temporal twigs, the former giving filaments to the *orbicularis palpebrarum*, and the upper eyelid, forms in the pterygo-palatine depression the upper palatine ganglion discovered and described by Meckel, a reddish body, of rather firm consistence, triangular or heart-shaped in figure, convex in its outer surface, flattened internally where it is directed to the spheno-palatine hole. From its convex surface this ganglion sends the superior-anterior nasal nerves; from its base issues the naso-palatine nerve; from its posterior surface the Vidian nerve; and from its lower apex spring the palatine nerves.

The first class of nervous filaments is distributed entirely to the nasal cavities, the ethmoid cells, the superior and middle turbinated bones, the upper passages of the nostrils, and the septum, running in this course between the pituitary membrane and the periosteum, and forming anastomotic conjunctions with the nerves of the first pair.

The naso-palatine nerve discovered by Cotugno and illustrated by Scarpa, sends twigs, according to Wrisberg, to the pituitary membrane, and arriving at the palate, either forms with the nerve of the opposite side a sort of plexus, or proceeding apart terminates in a membranous *papilla* behind the incisor teeth. According to Cotugno, who has traced the nerve most carefully, it forms communications with a branch of the facial nerve, with one or two recurrent branches of the *nervus vagus*, and forms below the inferior wing of the spheno-occipital bone a ganglion, which, however, was not found by Wrisberg or Soemmering. The whole of the twigs of these two branches are distributed to parts void of motion.

The Vidian nerve sends branches to the mucous membrane of the sphenoidal sinus, to the *septum* of the nose, branches called superior and posterior nasal to the pituitary membrane of the nostrils, where they communicate with those of the olfactory nerves, to the membrane of the vault of the throat and Eustachian tube, a few twigs to the superior *constrictor pharyngis*, and then, after traversing the Vidian canal, divides into two considerable branches, a superior or superficial, forming the reflected branch which returns into the cranium by the *hiatus* of Fallopius, and externally unites with the trunk of the facial nerve, —and an inferior, deep-seated or carotid branch, which perforating the *dura mater*, enters the carotic canal, and joining the sixth at an acute angle, thus forms the upper extremity of the intercostal nerve. These branches, excepting those sent to the upper part of the *pharynx*, are equally expended on organs void of motion.

The palatine branches send anterior filaments to the posterior nasal cavities, where they run between the pituitary membrane and the periosteum over the middle and inferior turbinated bones, to the glandular substance of the palate, the arch of the palate or roof of the mouth, the gums, the mucous membrane of the palate, and the mucous glands of the mouth;—posterior filaments to the tonsils, the *circumflexus palati*, and the muscular substance of the soft palate and *uvula*;—and external filaments to the *uvula*, tonsils, and palatine glands.

After emitting the numerous nervous branches, twigs, and filaments now briefly referred to, the superior maxillary nerve traversing the infra-orbital canal becomes the infra-orbital nerve, and is finally lost upon the nose, the teeth of the superior jaw, and the lips.

The inferior maxillary nerve, Bellingeri shows, sends a larger proportion of filaments to muscles than either of the two first divisions of the trifacial. But while these filaments are distributed to muscles, they are also sent to organs not muscular, as glands, membranes, and teeth. Thus, while the temporal cutaneous branch sends filaments to the duct of the parotid, the articulation of the lower jaw, the parotid glands, and ear and the skin of the forehead, vertex and occipital region, the same branch which sends filaments to the *mylo-pharyngeus* and external pterygoid muscles, supplies also the bones, the submaxillary and sublingual glands, and the inside of the gums, and the membrane of the mouth. The sixth division of this nerve, or the inferior alveolar, is, however, the one most completely distributed to muscles. Yet even in this the same branch which sends filaments to the *genio-glossus*, *stylo-glossus*, and *lingualis*, sends several to the membrane of the tongue; that which transmits filaments to the mylo-hyoid, genio-hyoid, and digastric, supplies also the glands and the four posterior molar teeth; and the mental or labial branches, send filaments at once to the muscles and skin of the chin and lips.

Of the smaller portion of the fifth pair, or that issuing from the peduncles of the brain, and to which he has given the denomination of the *Nervus Masticatorius*, Bellingeri gives a short but clear and accurate description, which shows that he had formed at an early period distinct notions of the remarkable difference of this division of the nerve from the larger. Its peculiar characters he justly represents to consist in the following circumstances; *first*, that it has a different origin, and pursues a distinct course from the larger portion; *secondly*, that it neither forms a semilunar plexus, or what has been named the Gasserian ganglion, nor is invested by the bracelet described by Malacarne in the large portion; *thirdly*, that its structure is quite different, its component filaments being whiter, thicker and stronger than those of the larger or plexiform portion; and, *lastly*, in this, that as Bichat already observed, it presents the common aspect of other nerves.

With this description before us, we confess we are much astonished at the assertions so gravely made by Sir Charles Bell, in his second paper *on the Nerves of the Face*, communicated to the Royal Society on the 28th of May 1829.

In that paper, after some introductory observations illustrative of the respective properties of the fifth and seventh pair of nerves, the author proceeds to give a description of the *Motor or Manducatory portion of the fifth nerve*, in which we find the following statement.

" Since the publication of my first paper this inquiry has assumed importance; although the principal facts of the anatomy were known to Wrisberg, Santorini, Palletta, Prochaska, and Soemmering. But in no author is the anatomy of the motor nerve traced with sufficient minuteness, in regard to the distinct uses of the muscular and sensitive divisions."

From this statement every reader must infer, that no description of this nerve, as a pure motor agent, existed before Sir Charles Bell gave the one which we must presume he wishes us to regard as not only the first, but the most minute and accurate. It is nevertheless, a very remarkable fact, that the present dissertation, published actually eleven years before the paper of Sir Charles Bell was read to the Royal Society, contains not only a most minute and accurate description of this motor division of the fifth pair, but one which is greatly superior to that in the Transactions in accuracy, precision, and method. In proof of the truth of this statement we have merely to refer our readers to the six pages included between the 93d and 100th of the dissertation of Bellingeri, and to the distinct and instructive tabular view of this nerve, its divisions, anastomotic communications and distributions, from all of which it will result clearly, that the description given as original in the Transactions of the Royal Society in 1829, is not only not original, but is greatly behind the Italian description of 1818, in accuracy and minuteness.

It is almost superfluous to add, that he distinguishes the emergent branches into four, the *Nervus Massetericus*, the *N. Crotaphiticus*, the *N. Buccinatorius*, and the *N. Pterygoideus*, all distributed principally to the muscles from which they are denominated, but connected by anastomotic communication with other branches of the fifth, and the *Buccinatorius* with those of the seventh.

We have also to mention that the description which Sir Charles Bell gives of the nerve which he denominates *Buccinalis Labialis*, and which is the *Bucco Labialis* of Chaussier and Bellingeri, is completely anticipated by the latter author. Indeed, how Sir Charles Bell can pretend to prefer the claim of distinguishing this as a manducatory nerve, is to us quite incomprehensible, when Bellingeri, in the year 1818, applied to it the denomination of *Nervus Masticatorius*, and maintained positively that is was entirely subservient to the muscles of mastication.

M. Bellingeri concludes his account of these two nerves by a general summary of their leading anatomical characters, which we think it may be useful to submit to our readers.

"The larger or plexiform portion of the fifth pair," he observes, "appears to spring chiefly from the olivary body, viz. from a sort of ganglion,—traverses the annular protuberance,—constitutes a ganglioform plexus, the fibres in the trunk and chief branches being manywise interwoven; and all its considerable branches are every where occupied by ganglions, and interlaced, while its chief ramifications are accompanied by blood-vessels. It forms not only numerous manifold anastomoses between its own branches, so that it seems to constitute a nervous circle, but also often repeated anastomotic communications with the third, fourth, and sixth pair of nerves, especially with the seventh; with the pneumogastric, the hypoglossal, and the cervical branches of the second and third spinal nerves; and it establishes a remarkable communication with the intercostal. By the ciliary nerves it communicates with the optic; by the nasal with the olfactory; by the petrous branch of the Vidian with the facial; and by the filaments connected to the *chorda tympani* with the internal ear.

"The fifth pair gives branches to all the muscles of the face, to the whole integuments of the head, to the globe of the eye, to the mucous membrane of the nostrils, and the maxillary sinuses; to all the glands, viz. the lacrymal gland, the tonsils, all the salivary glands, and the mucous glands of the nostrils, mouth, and ears; to the membrane, glands, and muscles of the palate, and the upper part of the pharynx; to the muscles and membrane of the tongue, and all the teeth; further, to the periosteum, and the external duct of the *meatus auditorius*; in one word, to every part of the face. In this manner it maintains a communication with all the organs of the senses; with the neck and trunk, and whole body, by means of the intercostal nerve.

"Meanwhile it is important to observe with Prochaska, that nature has in no part of the animal frame more strikingly evinced her proteiform character than in the construction of this nerve and the nervous system in general. It varies almost in all individuals a little in origin, structure, volume, and consistence, in the number and divisions of its branches, in its insertions, and anastomoses, than which there is no circumstance more fitted to explain the great varieties of physiognomy.

"The smaller portion of the fifth pair issuing from the peduncles of the brain constitutes a ganglioform plexus with the inferior maxillary only, presents the common aspect of most nerves of the human body, and is distributed to the chief muscles concerned in the process of mastication."

From these statements we think it cannot be doubted that Bellingeri understood and announced in the year 1818 the peculiar characters of the Trifacial Nerve, as one which regulates many functions and properties of common sensation, and even of physiognomical expression, and maintains a most extensive connection with the nerves of automatic motion or organic action, and that he equally understood the distinctive characters of its smaller portion as a nerve which regulates and controls muscular actions principally if not exclusively.

Of the firm portion of the seventh pair, the origin is threefold; one from the medullary *fasciæ* of the fourth ventricle, one from the restiform bodies, and one from the olivary, and perhaps partly from the annular protuberance.

It would be tedious to attempt to follow the author in tracing the numerous divisions and subdivisions of the nerve. It is sufficient to say, that the author shows that the great majority are sent to muscles; and that a very few filaments only are distributed to such parts as the vestibule of the internal ear, the substance of the tongue, the skin of the cheek, of the lips, and of the neck; and that even these may be sent principally to muscular fibres. It is indeed, as Bichat justly named it, a nerve of animal life,—in other words, presides over voluntary motions.

In the third division of his Dissertation on the Functions of the Fifth and Seventh Pairs of Nerves, these principles are still more clearly explained and demonstrated.

After stating briefly the sentiments of Galen, Willis, Vieussens, Meckel, Soemmering, Bichat, Gall, and Boyer upon the distinctive character of the Trifacial Nerve, M. Bellingeri proceeds to consider, in very methodical order, the arguments furnished by anatomy, physiology, pathology, and the general character of sympathetic actions, in illustration of the nature and properties of this nerve and its branches, and to prove that it contributes, particularly to those actions which belong, in the language of Bichat, to organic life.

He observes, in the first place, that its structure, in which it resembles closely the nerves of the organic life, the interlaced arrangement of filaments, the universal presence of ganglions, its repeated anastomotic communications, the occasionally augmented size of its branches, as in the trunk of the fifth, in the ciliary nerves, in the external nasal nerve, and in the posterior palatine nerve, which establishes some similitude to the intercostal, and its being uniformly accompanied by arteries;—a remarkable proof, according to Bichat, of connection with the functions of organic life,—are all in favour of this opinion. To this he adds, that the same view is confirmed by the circumstance of its origin from the olivary bodies, which may be justly considered as *ganglia*.

Arguments, however, still more forcible he deduces from the physiological history of the fifth pair. Thus, he observes, that its distribution to the *iris*, the lacrymal gland, the wide extended pituitary membrane of the nostrils, the maxillary, sphenoidal, and frontal sinuses, the teeth, the internal parts of the ear, all the salivary and mucous glands, the tonsils, the *pharynx*, and *periosteum*, shows that it performs only functions proper to organic life. If it be objected that it is also distributed to voluntary muscles, and to the integuments, it must be observed, nevertheless, that the filaments of the fifth pair are not alone distributed to such parts, but that other nerves are superadded. Thus, in the case of its emergence upon the face, above and below the orbit, at the temples, in the region of the cheeks, and at the mental hole, M. Bellingeri justly observes, that filaments of the seventh pair are immediately conjoined with those of the fifth by anastomosis so close, as to constitute almost one nerve.

If, on the contrary, he argues, the parts to which the ramifications of the fifth pair only are distributed, as in the lacrymal, nasal, dental, and palatine nerves, possess only organic properties, and none of those connected with animal life, does it not become probable, he asks, that when it is distributed to the muscles and integuments of the forehead, the lips, nose, and mouth, and the whole face, it contributes only to involuntary or organic actions, and that the voluntary motions in those of animal life and animal sense depend on the accessory nerves? When, indeed, the fifth pair is distributed to organs of sense, he infers, that the organic part of the properties of the organ depend on it, and the animal or voluntary on the proper nerves sent to the organs. Thus the involuntary motion of the *iris*, and of the muscles of the internal ear, and the organic sensibility of the pituitary membrane, are all equally under the influence of the fifth pair, the filaments of which are distributed to the parts respectively specified; whereas vision depends on the optic nerve, smelling on the olfactory, and hearing on the acoustic nerve; and by parity of analogy, he infers, that it is reasonable to think that the voluntary motion of the muscles of the face, and the animal sense of touch, depend on the influence of the seventh pair. To this he adds, that in the *velum* and its muscles, and in the *pharynx*, to which filaments of the fifth only are sent, the movements of these parts are almost entirely withdrawn from the dominion of the will.

He repeats at the same time the observation made by Gall, that the nerve of the fifth pair is more developed than all the nerves of the head in new-born infants, and even in the lower animals its size is proportionally greater than in the human subject. The life of the fœtus, however, being entirely organic, and the life of brute animals in the face making a nearer approach to instinctive or organic action than in the human subject,—he infers, that this circumstance also is in favour of the influence of the fifth pair being of that kind denominated organic or involuntary.

He next proceeds to show that the pathological evidence is also in favour of this doctrine; and, in the *first* place, adduces the fact, that division of the infra-orbital nerve in *neuralgia* of the face is not followed by palsy of the muscles, and then refers to the case of monstrosity observed by Mr Lawrence.

But while he maintains that the fifth pair presides chiefly over the actions of organic life, he admits, nevertheless, that animal life must depend secondarily upon it, and upon the integrity of the actions which it thus insures; and upon this principle explains the phenomena of the following interesting and characteristic case.

"Mussano Joseph Antonio, aged 35, of Bibia, an agriculturist, of sanguine temperament and robust habit, after witnessing several times an epileptic woman, was attacked by an intense mental affection, in which his sleep was disturbed, restless, and terrific. After some months he was attacked by weighty pain in the right occipital region, and after a few days palsy of the same side of the face ensued. He applied at the Hospital of St John a month and a-half after the commencement of the disease, when the following symptoms were remarked.

"Distortion of the mouth to the left side, pain above and below the orbit round the proper holes, also at the cheek bone, and near the *foramen menti* on the right side; palsy of the frontal muscle, the *superciliaris*, the *orbicularis palpebrarum*, the incisive muscles, the *caninus*, *zygomaticus*, *triangularis* and *quadratus menti*, and the *orbicularis* of the lips on the right side. The temporal, *masseter*, buccinator muscles, and tongue moved easily, and deglutition was unimpaired. Hearing, vision, and the motion of the *iris* were unimpaired, and smelling in both nostrils, as was ascertained by experiment. Meanwhile the irritation from pungent snuff was less in the right nostril, and there was a scanty flow of tears from the right eye; but when snuff was drawn into the left nostril, the irritation was more violent, and there was a more profuse discharge of tears; and when the nostrils were irritated by extraneous bodies, sneezing followed if the left was touched, but none if the right. Taste was much impaired and injured on the right side of the tongue, and touch was very much blunted in the integuments of that side of the face. There was also pain in the right scapula.

"From this case, we are taught that motion was destroyed in those muscles in which the large portion of the fifth pair is distributed, while it was entire in those to which the small portion sends nervous filaments; that the organic sensibility of the pituitary membrane was impaired; that its sympathy with the intercostal nerve, and with the filaments of the lacrymal gland, was impaired and almost abolished; and that while sight, hearing, and smelling were entire, taste and touch were much injured."

The particulars of this case and the explanations, which were published, as we have stated in 1818, show, we conceive, most satisfactorily that Bellingeri understood perfectly the distinctive physiological properties of the two divisions of the fifth pair several years before the theory of the influence of these parts was explained by Sir Charles Bell and Mr Mayo. To us, also, it appears that the explanation given by Bellingeri is much clearer, more precise, and more methodical, more logical, and less embarrassed with irrelevant statements than we any where find it in the writings of Sir Charles Bell.

Bellingeri next proceeds to illustrate and enforce the same principles, by taking a view of the influence of the fifth pair over mental emotions, sympathetic actions generally, and in the expression of passion; and here we cannot refrain from expressing our admiration of the interesting and ingenious manner in which the author has applied his knowledge of the distribution of the branches of the fifth pair, to explain some of the most important emotions, sympathies, and expressions of feeling. We remember well the interest with which we perused at an early period the few scanty observations of the first Monro on this subject, thrown out often in the form of queries, to excite the inquiry of the student. We have also very agreeable recollections of the immense number of beautiful and interesting generalizations brought forward in the clearest manner by Whytt on the subject of sympathy generally. And lastly, we shall not soon forget the feelings with which we read the bold and imposing, and, though sometimes loose, often philosophical views given by Bichat, of the chain of sympathetic actions which his happy distinctions and powerful genius enabled him to trace so clearly. One painful thought alone interrupted this feeling. Too often the French physiologist, in his eager precipitation to establish a complete and perfect view of a particular theory or hypothesis, and to prove his doctrines in all points accurate and applicable, availed himself of doubtful facts or loose analogies, which, when detected, necessarily produced a general feeling of diffidence even of the most perfect and finished of his doctrines; and made us return with renewed pleasure to the calm and patient deductions of the Edinburgh professor.

We frankly acknowledge, that the observations and reflections of the present author on this subject appear to us valuable, in making a nearer approach to those of Whytt than those of Bichat. These observations the author has distinguished into physiological, pathological, and therapeutical, and into those proper to the fifth pair, and those illustrating the functions common to it with other nerves; and, though our limits will not admit of our reproducing them here, we recommend them to the diligent attention of our readers, as extremely interesting and important, in affording the satisfactory explanation of many physiological, pathological, and therapeutic facts of daily occurrence. Some of the remarks on the general theory of the operation of sympathies may be properly noticed.

Sympathetic sensations and actions are performed, according to physiologists, Bellingeri remarks, by the cellular tissue, the blood-vessels, membranous tissue, either serous or mucous, by the similar construction of an organ or by similitude of function, and finally by means of nerves. Bellingeri is of opinion, that they depend on the connected or associated action of nerves only; and to this principle he refers sympathies of sensations, motions, secretions, augmented, diminished, and perverted circulation;

none of which, he maintains, can be explained by means of the other organic systems. The inquiry into the nature of the exact process by which these sympathies are accomplished, however, has given rise to a good deal of controversy. While Astruc, Van Swieten, Haller, Monro, and Whytt maintained that they took place by means of the intermediate agency of the brain, Vieussens, Boerhaave, Walther, Meckel, and others, on the contrary, asserted that they were effected by anastomotic communications, plexuses, and ganglions; while Scarpa, adopting an intermediate doctrine, allowed that the anastomoses, plexuses, and ganglions contributed their proportion to the accomplishment of sympathies, but maintained that they were completed by means of the roots of the nerves connected with the brain and spinal chord. Bichat, distinguishing all sympathies into those of animal sensibility and contractility, and organic sensibility and contractility—sensible and insensible, maintained that those which affect animal contractility are performed by the brain by means of the nerves, and that all the others are executed without the agency of the nerves, and in a manner hitherto unknown.

The present author, adopting part of this view, proposes to distinguish all sympathies into animal and organic, the former depending on the brain, the latter independent of it. That sympathy he refers almost always to the head of animal which causes desires of food or the venereal appetite to be excited by smell, vision, and hearing, since they are performed with mental consciousness, and may be prevented by an effort of the will. Organic sympathy, on the other hand, he represents to be that which takes place without the intervention of the brain, and involuntarily; for instance, when in the case of stone in the kidney, the stomach is deranged and vomiting ensues, which take place without the privity of the mind and against its will. That these sympathies take place without the intervention of the brain he thinks is satisfactorily established by the experiment of Whytt, in which, after removal of the head of a frog, upon irritating the inferior extremities, the muscles of the whole body were convulsively affected; and to this he adds the fact, that the greatest part of these sympathies is accomplished by nerves which depend least on the control of the will, viz. the intercostal, pneumo-gastric, and trifacial, and therefore infers, that all organic sympathies generally depend on anastomotic communication, plexiform arrangements, or ganglions.

In the case of the fifth pair, indeed, he observes, that it is impossible to explain its consent with the intercostal by the medium of the brain, or in any other mode than by anastomoses and ganglions, since the communication of the intercostal with the fifth is completed, not in the brain but in the course of the fifth, whether the latter sends or receives the communicating branch, or does both. *Lastly*, he adds, the few examples of infants void of brain and spinal chord, who have lived some little time and taken food, afford evidence of the same description.

Bellingeri then proceeds to show on what evidence and in what manner the fifth pair regulates the involuntary motions of the various organs of sense, viz. the motions of the iris, of the internal ear, and of the pendulous *velum* and pharynx.

The iris, he observes, derives its nerves from the ophthalmic ganglion, which is formed by the fifth in conjunction with the third pair. In some very rare instances, he observes, the motion of the iris has been found to be dependent on the will, and in these, he argues, that the ciliary nerves received no branches from the fifth, as he shows in several instances in the anatomical description. It is, at all events, he observes, known that in certain species of animals, for instance the parrot, owl, and the ray *genus* among fishes, the circumstance of the iris being under the will of the animal is connected with that of the want of ophthalmic ganglion.

The involuntary motions of the internal ear he in like manner attributes to the .anatomical fact, that the *chorda tympani* consists of filaments of the lingual branch of the fifth pair extended over the chord, and to the associated fact, that the muscles of the *stapes* and *malleus* receive no branches from the seventh pair, until the latter has been formed by the petrous branch of the Vidian nerve of the fifth pair, after which it immediately distributes the appropriate filaments to the muscles specified.

In like manner, when we consider the motions of the *uvula*, *velum pendulum palati*, and upper region of the pharynx, all of which are involuntary and instinctive, we find that these parts, and the *circumflexus palati*, and the *levator palati*, are all supplied by the palatine nervous filaments of the fifth pair ; and he properly contends, that, though mastication and deglutition be in some degree voluntary motions, those of the uvula, palate, and upper division of the pharynx are entirely involuntary, and accomplished without the effort or consciousness of the individual.

From the palatine he proceeds to the lingual branches of the Fifth. And here he accurately observes, that the various nervous sources from which the tongue is supplied, are connected with the various sorts of functions assigned to it. The tongue, he remarks, receives three distinct orders of motive nerves of considerable size, viz. the lingual of the fifth pair, the glosso-pharyngeal, and the hypo-glossal, the greater part of both of which latter nerves are expended on the organ.

To explain this distribution, he observes, that the tongue performs a mixed class of motions, which are sometimes voluntary, sometimes involuntary. The involuntary or instinctive motions are those exhibited in sucking, mastication, deglutition, and crying, in the performance of which the tongue assists much, and which, indeed, the new-born infant exercises instinctively. The lingual branch of the Fifth Pair contributes to the involuntary motions, partly anterior, partly posterior, since it sends filaments to the internal pterygoid, the *mylo-pharyngeus*, the *stylo-glossus*, the *lingualis*, and the *genio-glossus*, giving these muscles some degree of an organic and involuntary character,—and communicates a more complete involuntary character to the pharynx, the tonsils, and the submaxillary and sublingual glands.

But the complete organic and involuntary character, the author observes, is communicated to the tongue by the glosso-pharyngeal nerve, which not only sends filaments to the whole pharynx, but to all the muscles of the tongue, both its basis and body and apex. As the organic character of this nerve is questioned by none, the author therefore infers, that the involuntary motions of the tongue are communicated in the greatest degree by the glosso-pharyngeal with the branches of the fifth and the pneumo-gastric nerves.

As, however, the tongue performs various important voluntary motions, it is requisite, he observes, to be supplied by branches from a nerve of voluntary motion; and this he proceeds to show is effected by the hypoglossal nerve, which, besides being distributed to the whole of the tongue and its muscles, and the voluntary muscles, which move the organs of voice, transmits also twigs to the diaphragm. As in this distribution it is evident, the author remarks, that the hypoglossal nerve is subservient, in the other organs, to voluntary motion, he infers that it must perform the same function to the tongue; and he thence infers, that the hypoglossal is the nerve for articulate speech, and modulated sound in singing. This inference derives very strong confirmation from the fact, that in fishes *(pisces muti,)* the hypoglossal nerve is wanting.

In the case of the inferior maxillary he argues, that its distribution shows that it is also a nerve of involuntary or organic action; for, though it sends filaments to the *mylo-hyoideus*, the anterior belly of the digastric, and all the muscles of the chin and vicinity, and thence opens the lower jaw, shuts and separates the mouth, yet, as these actions are connected with the organic process of nutrition, in the prehension, mastication, and deglutition of food, they must be viewed as motions connected with organic life; and the mere fact, of the other filaments of the same nerve being sent to the teeth and the labial glands, shows that the whole nervous branch must be viewed as associated with the organic class of tissues.

This part of the subject he then concludes by pointing out the influence of the fifth pair over all the secretions, viz. the lacrymal, that of the Meibomian glands, the mucous secretion of the pituitary membrane of the nostrils, the salivary secretion of the sublingual, maxillary, and parotid glands, the mucous of the muciparous follicles of the palate, mouth, cheeks, tongue, lips, and tonsils, and even the *cerumen* of the ears. He even maintains that its constant association with the minute arteries of the face is intended to regulate the circulation of that part of the body, and that all the variable changes which the colour of the cheeks undergoes in shame, rage, terror, indignation, horror, joy, hope, and desire, are to be attributed to the sovereign influence of the fifth pair over the facial capillary circulation.

He then enters upon a minute inquiry into the influence of the Fifth Pair over the sensible functions of touch, smell, and taste.

Distinguishing touch with Magendie into the two modifications of common or general touch, and the delicate and refined sense named *Tact*, and subdividing the former into physiological and pathological touch, or cutaneous sense, he admits that common or ordinary tact is entirely guided by the fifth pair; but this is the ordinary species of sense common to all nerves, and equally belonging to those regulating secretion, and those presiding over motion. The peculiar tact called *human* or *animal*, found in the face, he ascribes neither to the fifth pair alone, nor to any individual nerve, but to the numerous, repeated, and multiplied inosculations of the Fifth with the Seventh pair.

In the case of the sense of smell, he distinguishes the function into two divisions,—one, animal smell, properly so named, exercised by the will; the other, natural or instinctive smell, which is exercised independent of the will. The first division of the function he regards as under the influence of the first pair, or proper olfacient nerves; the second division he considers to be performed by the filaments of the fifth pair. Hence this division of the faculty of smell is common to infants; or when the fifth pair is large, and is very powerful and energetic, in most of the lower animals, for instance dogs, and certain birds, as the owl, the crow, in which the fifth pair is exceedingly large and well developed.

Of an apparent difficulty in this part of the inquiry, he next affords a very ingenious explanation. If it be asked, he says, why the nerves distributed to the chambers of the nostrils issue in so complex and multiplied a manner, some directly from the brain, some from the *spheno-palatine ganglion*, others from the Vidian nerve, and others from the palatine nerves? it is answered, that it is manifest that no single nerve could have answered the purpose intended. Although the olfactory nerve might communicate the specific faculty of distinguishing smell, yet that faculty could not be exercised properly, unless the pituitary membrane was always in a certain state of humidity, and unless its circulation and secretion were so perfect as to keep it always sensible, and hence the necessity of branches from the *spheno-palatine ganglion*. Smell is so inseparably connected, in practical exercise, with taste and deglutition, that a degree of union of action between the organ of smell, and the palate and organ of taste, is also necessary; and this purpose is accomplished by the nervous filaments derived from the palatine branches. And, lastly, the sense of smell is one, the impressions of which must be conveyed to the heart, stomach, intestines, and even the genital organs, according to the constitution of the animal frame; and this purpose is effected by means of the filaments derived from the Vidian nerve. It is upon this physiological principle, the author conceives, that natural smell presides, at least in savage life and brute animals, over the function of nutrition, by aiding in the choice of food, and over that of respiration, by aiding in the choice of proper air, for the purpose of respiration.

Bellingeri next proceeds to consider the question, whether the lingual branch of the fifth pair, or the hypoglossal, be the proper nerve of taste? and after a general survey of the opinions maintained by Willis, Vieussens, Haller, Boerhaave, Guericke, Albinus, Meckel, Portal, Richerand, and Magendie, directs the attention of his readers to the anatomical distribution and physiological properties of the various branches of nerves ramified in the tongue. This organ, he remarks, derives nerves from four different pairs of nerves, viz. the glosso-pharyngeal, the hypoglossal, the lingual branch of the fifth, and the seventh pair.

Among these nerves, he observes that it is impossible to suppose the glosso-pharyngeal to be a nerve of taste, because, though its filaments are distributed to the *papillæ*, yet they are especially sent to the cup-like *papillæ* behind the *foramen cæcum*, where no taste exists; and it is further a ganglioned nerve, and was already shown to preside over the involuntary or instinctive motions of the tongue and larynx.

The question would, therefore, be between the hypoglossal and the lingual branch of the fifth pair. The former must, he had already shown, be regarded as a nerve of voluntary motion, and contributing principally to the regulation of the movement of the tongue, especially in speech and articulation. It further appears that observations show, that when the tongue is destitute of the faculty of articulation, taste may remain unimpaired, and conversely, from certain observations of Columbus and Rolfink, in which the lingual branch of the fifth was wanting, that taste was also gone, but that the voluntary motion of the tongue remained. From these circumstances, he infers that taste, and the animal motion of the tongue, are under the influence of different nervous trunks, and that, in all probability, and so far as such an inquiry can become the subject of accurate reasoning, the hypoglossal may serve for touch, and that the more delicate faculty of taste is under the influence of another nerve entirely distinct.

This, he thinks, is the twig denominated *chorda tympani*, which supplies not only the animal sense of taste, but the partly voluntary motion of the tongue; and he thinks further, that this arrangement is in accordance with that of the other organs of sense, in which we find a double nervous system, one of the proper sense peculiar to the organ, the other performing certain common sensitive functions to the organ. The principal point to be noticed in this part of the inquiry is, that to the lingual branch of the fifth pair, according to him, is assigned the faculty of communicating and regulating the intensity of this common or organic sensibility of the tongue.

In this manner Bellingeri shows, or at least studies to show, that the Fifth Pair of nerves is in every respect to be regarded as possessed of organic properties, and whether it presides over organs of motion or sensation, circulation or secretion, these motions are invariably of the class independent of the will, or what are to be regarded as strictly organic. All this is to be understood, however, he adds, of the larger or plexused or ganglioned portion only.

One circumstance has been forcibly impressed upon us in studying the views given by the author on this nerve. It is this. The great use of the Fifth Pair appears to be not so much to perform any specific or particular function in relation to one organ, but to exercise a general control or influence over the whole. Bellingeri, for example, shows that it communicates with all the organs of sensation,—with the eye, the ear, the nasal cavities, the palate, mouth, and tongue, and that it is diffused along with the minute arteries over the whole face. The general result of this arrangement must be, that it is a nerve neither of vision nor of hearing, of smell nor of taste, or deglutition, nor of touch, or physiognomical expression, but that it exercises a general and common modulating power over the whole of these faculties and their proper organs, and that, in all probability, it maintains between them a mutual consent or sympathetic relation absolutely necessary to the proper separate exercise of each and the conjoined exercise of all.

The author then explains shortly his views on the function of the small or muscular portion of the fifth pair. These it is unnecessary to detail, as they amount simply to this, that the nerve evidently regulates the movements of the temporal, masseter, buccinator, and pterygoid muscles, to which it is distributed. One circumstance only merits notice. It appears in certain parts to preside over involuntary motions; for example, the buccinatorial branch, not only regulates the movements of the *buccinator* muscle, but it transmits filaments to the duct of Steno and the buccal glands. It may be here asked, does it not receive these filaments from the larger or gangliophorous portion of the nerve?

Bellingeri next proceeds, in his second chapter, to adduce such evidence as may show that the seventh pair of nerves or the facial presides over the animal functions of the head, face, and neck, that is to say, over sensation and motion, as animal or voluntary faculties.

This he does, first by referring to its anatomical peculiarities, in which it altogether resembles the nerves of the animal functions. Thus it nowhere forms ganglions; it has a common structure with that of the nerves of animal life, by the remarkable plexuses and the frequent anastomotic communications; it is inserted almost entirely into the skin and muscles; and it may be therefore denominated the musculo-cutaneous nerve of the head and neck. In favour of the same fact also, he adduces its origin, principally from the medullary bundles and the restiform body, and from some filaments of the olivary bodies; and he adds, that, as it issues principally from the productions of the brain and cerebellum, we must infer that it is subservient to animal sensation and motion.

In so far as it is distributed to the skin of the head, face, and neck, Bellingeri thinks that it must be regarded as contributing to animal sensation; and when it is also added, that it is distributed to all the muscles of the external surface of the head, excepting the temporal, into the *stylo-hyoid*, and the posterior part of the digastric and the *platysma myoides*, it must be considered as probable, from what was stated already regarding the fifth, that it contributes essentially to the faculty of animal or involuntary motion.

Under the head of pathological evidence to the same effect, the author gives the following characteristic case:—

"In the Hospital of St John, under the care of Professor Geri, was a man who had long laboured under an inflammatory tumour, extending behind the right ear, above and below the mastoid process, in such a manner, that it compressed the facial nerve at its point of emergence from the stylo-mastoid hole, as was the decided opinion not only of the professor, but of Drs Gallo and Riberi. Meanwhile, almost universal palsy of the right side of the face, and distortion of the mouth to the left, was observed. There was complete palsy of the frontal muscle, the *supraciliaris*, the *orbicularis palpebrarum*, the *levator alæ nasi labiique superioris*, the *caninus*, *zygomaticus*, right side of the *orbicularis oris*, the *triangularis* and *quadratus menti*, and the *platysma myoides*. The motion of the temporal, masseter, buccinator, and pterygoid muscles, was entire, or very slightly affected; and of the digastric we could form no accurate judgment. The motion of the globe of the eye and the upper eyelid was unaffected, but vision was a little disordered in the right eye; the tongue was moved with some difficulty, yet taste was experimentally shown to be unimpaired in both sides; the sense of touch was entire in the face; hearing was very much impaired in the right ear, but the abscess had opened in the external ear. Death took place after about two months.

"Upon inspecting the parts, purulent matter was found in the cavity of the *tympanum*, and contained in the aqueduct of Fallopius and compressing the facial nerve in its course. There was no purulent matter, nor traces of inflammation after death, round the stylo-mastoid hole; but marks of recent inflammation and suppuration were found in the right lobe of the *cerebellum*. The fibres and trunk of the fifth pair were entire and uninjured."

He adds at the same time, that, wherever the facial nerve is affected with neuralgia, a spasmodic and convulsive motion of the muscles of the face and neck ensues.

With the view, however, of determining the respective influence of the fifth and seventh pairs, the author appeals not only to comparative anatomy, but to experiments performed on the bodies of the lower animals.

He divided, for instance, the seventh pair in a rabbit, in its course near the parotid gland; and palsy of the muscles of the eyelids, and upper and lower lip on that side ensued. Upon dividing on both sides nearly in the same place, the seventh pair of nerves, complete palsy of the eyelids and upper and lower lips ensued; and the sensibility of the face appeared very much impaired, for, on plucking out hairs by the roots, it gave no signs of sensibility or pain; yet the animal continued to move its ears, to open the jaw, and to protrude the tongue from the mouth.

Bellingeri, however, proceeds still further in the properties which he assigns to this nerve. Instead of, like Sir Charles Bell, saying that it is devoted to the voluntary motions of the head and face, he represents it also to be the agent of that class of sympathetic actions which are distinguished by the name of animal; that is to say, those which, in the language of Bichat, depend on animal sensibility and contractility, are performed by the intervention of the brain and the consciousness of the mind, and may be interrupted by a voluntary effort. Thus the sympathetic action by which an animal, on hearing a particular sound, pricks up his ears to listen and watch, and the winking motion of the eyelids which take place in man upon hearing startling sounds, or seeing suddenly a bright object, he ascribes to the general connecting influence of the seventh pair. It is upon the same principle, he says, that so many persons exhibit the tendency to beat time in accordance with certain measured or modulated sounds, that the soldier marches to the cadence of martial airs, and the dancer poises his person and moves his limbs to the measures of the minuet, the waltz, or the hornpipe.

We must now, however, hasten over some other ingenious and interesting observations, in order to give the general summary, which we think will be best done in the language of the author.

" We have seen, therefore, hitherto that the seventh pair of nerves is chiefly subservient to actions of the animal order; and if any one urge the objection, that it presides over involuntary motion in the internal ear, let him consult what we have said on this subject on the fifth pair; let him further observe, that there it forms a small ganglion, as takes place in the ciliary nerves; but since it also gives several branches, equally considerable, to the parotid gland, there will always be a difficulty in this, that in certain places it is subservient also to involuntary motions and the actions of organic life. It must be further allowed to be subservient to the latter division of the animal frame, when it sends filaments to the mastoid cells, the tympanal membrane, the long limb of the anvil, round the jugular foramen, and the muscle inserted into the Eustachian tube.

" Upon this point, however, I shall observe, that the seventh pair ought not to be regarded as a single nerve, but as one consisting of two portions, viz. a larger and a smaller, discovered by Wrisberg, which has a distinct origin and structure, and preserves a separate course from the larger portion of the nerve. I must suspect, therefore, that the few involuntary actions which the seventh pair performs depends on the smaller portion, which would be better known, perhaps, if its distributions were also known. It is only, indeed, by knowing the distribution of the smaller portion of the fifth pair, that we have been enabled to demonstrate the fact, that it performs different duties from those of the larger portion; since the smaller alone obeys the will, while the larger is not under that influence.

" Further, we may so far conjecturally infer, that the small portion of the facial nerve is subservient to organic functions; for since its filaments seem to issue partly from the substance of the *Pons*

Varolii, and partly from the olivary eminences near the origin of the glosso-pharyngeal nerve; and, as it was said above, that nervous filaments issuing from the olivary eminence contribute to the actions of organic life, it must follow that this character is applicable to the smaller portion of the seventh pair. As, therefore, the large portion of the fifth pair, in my judgment, is subservient to the functions of organic life, and its small portion is dedicated to muscles of voluntary motion; so conversely, the larger portion of the seventh pair is devoted to the purposes of animal life, and its smaller portion to those of organic life; and if this be admitted, it will be easily granted, that the muscles of the internal ear are moved by the filaments of the small portion of the facial nerve. Since, therefore, the origin and structure, and function also, of the small portion of the fifth and seventh pairs are different from those of the large portion, I justly infer that both portions constitute a distinct pair of nerves.

"We conclude, therefore, that the facial nerve performs almost all the voluntary motions in the head, presides over animal sensation in the face and neck, produces laughter, expresses the emotions of the mind and the passions of the soul, and is the agent of all the animal sympathies; hence we also observe the reason why the branches are connected by so frequent anastomotic unions and plexuses;—to act in mastication, deglutition, voice, speech, and singing, and, like the fifth, to constitute some part of all the organs of the senses. It sends branches to the internal and external ear, defends the eyes by means of the eyelids, enters the inferior chambers of the nostrils, gives the tongue a considerable branch, is the agent of animal touch on the skin, and everywhere in these parts is subservient to the functions of animal life."

At this point, which forms the conclusion of the physiological part of the dissertation, we must for the present pause. It is altogether unnecessary to point out to our readers how completely Bellingeri has anticipated by several years all the physiologists who have devoted their attention and inquiry to this subject. That must have appeared abundantly manifest in the course of this article; and we have no doubt that every one who peruses the dissertation with attention will be satisfied that the Italian has given a much more clear and connected view of the anatomical and physiological history of these two nerves, than any one of the writers who have yet attempted the task. The most extraordinary part of the business is, that the views of Bellingeri should have been so long unknown and overlooked, that his claims to discovery should have been disregarded, and that, in all the discussions relative to this subject, his name is never once mentioned.

All this has an appearance so much the more unfavourable for this country, that the author sent to the Royal Society of London in 1819, a copy of the dissertation now before us, and that it was presented to that learned body on the 20th of January 1820, as is proved by its being acknowledged at that date among the list of donations. There, however, it appears to have been either buried in the inglorious oblivion of the multitude of works which find their way into that far-famed institution, or,—but no, we cannot allow ourselves to give utterance to the alternative. Is this, we beg to ask, the treatment awarded to scientific foreigners by the Royal Society of London? Is this the encouragement given to long, patient, and assiduous inquiry, to learning and knowledge of a subject almost unrivalled, to genius, we may say, rectifying errors, reconciling discordances, bringing order and method out of confusion, and facilitating the labours of the future generation, by the establishment of a series of beautiful general deductions?

By other bodies and by other individuals, the researches of this able observer have been more kindly treated. Not only did Omodei, the editor of the best journal in Italy, give an account of his labours in his Journal for November 1818, but a short extract was published in the *Bibliotheca Italiana* in August 1819. The leading physicians of Italy also, as Scarpa, Joseph Frank, Borda, Tomassini, Brera, Medici, and Francis Hildenbrand, all admitted the originality, as well as the value, of the views of Bellingeri; and Professor Martini, in the fourth volume of his *Lezioni di Fisiologia*, giving a historical sketch of opinions on the functions of the nerves, assigns the priority to his countryman.

Lastly, Francis Hildenbrand, in the second volume of the *Annals of the Clinical School of Pavia*, has given a clear and unequivocal testimony, not only to the justice of the distinctions of Bellingeri, but to their originality, and of his having preceded all the other inquirers.

" Qui hancce Neurophysiologiae Spartam hodierno aevo excoluerunt, Viri eximii, BELL, MAGENDIE, ROLANDO, aliique, posteritatis gratitudinem sibi omnino vindicant. Singularis vero laus debetur clarissimo BELLINGERIO, cujus amicitiam honori duco. Indefessus iste naturæ scrutator, Taurinensium medicorum decus, *primus sane fuit*, qui nervorum cerebralium functiones haud communi pervestigabat ἀκριβεια, atque differentiam essentialem inter nervos motorios et mere sensitivos validissimis evicit argumentis, teste pulcherrima dissertatione, quam anno 1818 typis edidit."

It is from a sense of justice that we have now endeavoured to render to a distinguished foreigner the meed of merit and honour which is unquestionably his due. Though we avow our regret that we have been so tardy in performing this duty, we have some satisfaction in knowing that it was not earlier in our power. No copy of the dissertation was sent to us; and for the use of the present we have been indebted to the kindness of a distinguished friend.

In perusing it we have another proof of the superiority of the Italian genius for inquiries of the kind now mentioned. The reasonings in the present essay reflect the greatest credit on the country of Mondini, Berenger, and Eustachi, Varoli, and Aranzi, Valsalva, Santorini, and Morgagni, and show that the ingenious author is fitted to maintain the reputation acquired for his native land by so many illustrious names.

It must be rather mortifying for Sir Charles Bell to find, that, while on the one hand, Magendie lays claim to his discovery of the different functions of the anterior and posterior roots of the spinal nerves, and concedes to him the merit of distinguishing the sensiferous faculty of the larger portion of the fifth pair, and the motiferous faculty of the small portion, and of the seventh pair,—on the other, the just claims of M. Bellingeri deprive him even of any title to the latter discovery; and the dissertation of that author affords abundant evidence that he had, in 1818, explained the whole of these distinctions in the clearest manner.

The only parallel situation which we can remember is that of the old Abbot, who, when told that some person had before said all that he was now saying, addressed his remembrancer in the following characteristic language: "*Pereant illi qui ante nos nostra dixerunt.*"

Art. II.—*The Principles and Practice of Obstetricy, as at present taught by* James Blundell, M. D. Professor of Obstetricy at Guy's Hospital. In Five Parts. *I. The Anatomy of the Female System. II. The Physiology of the Female System. III. The Signs and Diseases of Pregnancy. IV. The Art of Delivery. V. The After-Management of the Puerperal State, the Diseases of Puerperal Women, and Strictures on the Diseases of Infants. To which are added Notes and Illustrations,* by Thomas Castle, M. D. F. L. S. Member of Trinity College, Cambridge, &c. &c. London, 1834. 8vo, pp. 838.

It is certainly a subject much to be deplored, that those whose talents and experience have invested them with celebrity as teachers and practitioners too often feel neither leisure nor disposition to give to the profession an accurate view of the system of principles and practice by which they have obtained so much distinction. The name of Dr Blundell stands so high as a physiologist and obstetrical teacher, and as the not unworthy pupil and successor of Dr Haighton, that all who are interested in the diffusion of correct practical knowledge must feel great anxiety to see a just view of that body of valuable instructions which his judgment and experience have enabled him to collect and to verify. For digesting these instructions, however, and preparing them for the public eye, Dr Blundell appears never hitherto to have been able to command sufficient leisure; and the duty, therefore, has been undertaken by, or delegated to, Dr Thomas Castle.

This duty may not have been the worse performed on this account; and perhaps it is actually done in a better style, and less objectionable manner. But it has the effect of placing those whose duty it is to judge of the intrinsic merits of the work in a predicament of some delicacy and no small difficulty; since it is not always easy to say how far the merits and demerits of the work may belong to the original parent of the production, or to the gentleman who undertakes the affectionate task of obstetrical operator, in ushering the work before the public. It must be further observed, that the name and reputation of Dr Blundell necessarily carry with them a certain degree of weight which, it would be affectation to deny, cannot attach to the mere editor of the work. These observations we are led to make for various reasons, but chiefly because we think that if Dr Blundell had enjoyed, or been able to secure, the necessary leisure for the task of publishing his own lectures, the present work would have appeared in a form more likely to reflect lasting credit on its author than the present. It is evidently the mere transcript of the extemporaneous lectures of Dr Blundell, with all the beauties and all the blemishes which necessarily attach to such discourses.

The enumeration of its several divisions in the title-page will give a pretty just idea of the general arrangement of the work, which further differs not very materially from that of other treatises on midwifery. But in the manner in which the instructions are communicated, a very material and striking difference is observed. With a constant desire for singularity and originality in principle, much boldness of thought and reasoning, a love of controverting common and received opinions, though sometimes just enough, all expressed in an imposing, antithetical, and smart style of language, and delivered in a tone of confidence and decision, very amusing, but neither unbecoming nor disagreeable, we find a great deal of very valuable and useful information on the most important questions of the physiology of generation and pregnancy, and the practice of the obstetrical art.

No doubt can be entertained, that with many readers the adventitious qualities now alluded to are calculated to recommend the substantial contents of the volume; and many a student who would nod over the common-place descriptions and statements of theoretical principles and practical rules, will peruse with interest pages in which the voice of the lecturer seems still to ring in his ears. It must be admitted, nevertheless, that the style, which seems well calculated for an extemporaneous address, does not suit with equal felicity for one which is to be read in the closet, and that many of the brilliant pieces of wit with which such a discourse is animated, become almost useless in the hour of emergency, when the practitioner wishes to decide in an ambiguous point. We fear, indeed, that this work will not realize the expectations of the profession in all respects. The matter is, in general, valuable, often original and interesting, and the practical directions are always sound and safe. But the manner in which the information is communicated is not calculated to impress the reader with a very high idea of the dignity of the profession of midwifery, and will inevitably lead to the conclusion, that the lecturer often indulges in a discursive manner, and a tone of levity, which are not suited to the simplicity of science. Without attempting a formal analysis of a volume so bulky, and of subjects so often treated in our pages, we shall advert to a few of the most important, and, by showing in what manner Dr Blundell treats his subject, endeavour to convey some conception of the kind of book which has been thus produced.

Every one knows that the physiology of generation was the great legacy bequeathed by Dr Haighton, to be cultivated, illustrated, and embellished by the diligence and genius of Dr Blundell; and few are ignorant that Dr Blundell has sacrificed whole hecatombs of rabbits in the laudable undertaking of withdrawing the veil in which this process is involved. On this subject, among other points which require determination, two are preeminent; *first*, whether the contact of any impregnating material fluid, solid or gaseous, be requisite? and, *secondly*, how much or how little of that is requisite to the formation of the new being? On these questions, we find the following observations by the present author.

"The two substances being generally necessary, in order that organization may be effected, it has often been inquired by physiologists, whether it be further requisite, in all cases, that these two substances should come into contact with each other? So large a question is difficult to answer; indeed, we never could obtain an absolute demonstration of the affirmative, unless we were to make our observations on almost all the different species of living structure.

"The ova of the frog are impregnated by the male, after they have left the body of the female, while they are yet in the verge of the vagina. And Trembley, I think it was, interposing an impervious texture—a sort of trowser—between the genitals of two animals, found that, while the rest of the eggs were productive, those which issued from the female, while this veil was interjected, were incapable of producing; so that in this animal, at least, of oviparous generation, impregnation is accomplished by an obvious contact of the two substances with each other.

" *Experiments proving contact necessary.*—By experiments on the rabbit, I have endeavoured to prove this same principle, in respect to viviparous generation; and I found in the results of these experiments, that in the rabbit, and, therefore, probably, in all those structures which essentially resemble that of the rabbit,—perhaps, also, in living bodies generally,—in order that a new structure may be produced, the semen and the rudiments must come into contact with each other; and to this conclusion I came, though I set out with a very different persuasion, derived from the observations made by a man to whose example I owe so much,—my relative Dr Haighton; so that it was entirely in consequence of experiments made, and not from any prejudices left on my mind by the opinions of my excellent and philosophical preceptor, that I came to the conclusion that, in the rabbit, at least, unless the male and female substances are actually blended together, a new structure cannot be produced. A wholesome scepticism is one of the eyes of philosophy; in the communion of science, doubt is no crime.

" In order that you may comprehend these experiments made on the rabbit, it is, perhaps, necessary to remark, that, in this animal, the vagina is extraordinary, both in its length and capacity; so much so, indeed, that when the canal is full-grown, the forefinger may be introduced into it, without much stretching or other injury. It should, too, be further observed, that, in connection with this vagina, she has two wombs, which are in form like the little finger, when incurvated in this manner, and perforated from one extremity to the other; the inferior opening into the vagina by a mouth distinct from that of the corresponding uterus; the superior receiving that oviduct, or Fallopian tube, which stretches from the womb to the ovary, and forms the channel by which the two viscera are communicating with each other. The two wombs, therefore, are, in the main, distinct organs. Instead of the *os uteri* being single, there are two.

" Well, now, in some of the experiments made, I opened the abdomen, above the *symphysis pubis*, to the extent of about an inch, taking care, by compression, to excite the contraction of the bladder, so that it might withdraw into the pelvis, and get completely out of the way. This done, by a little well-directed pressure, I urged the head of the vagina, with its wombs, through the opening, the parts then lying forth upon the downy fur of the animal; and all this, when the operation was dexterously performed, without occasioning much severe pain. The womb lying under the eye, I then divided it clean through, near its mouth, carrying the incision a little way into the mesometry; the divided portions of the womb, immediately after the separation, moving out of apposition, and afterwards healing in such a manner that, at the line of division, the canal of the uterus became shut up, though its structure, in all other particulars, remained healthy enough. After this operation, some of the rabbits died with abdominal inflammation, in the way that these animals frequently do when no operation has been performed; but others, and by far the greater number, recovered completely, and admitted the male; when I observed, that on the side where the uterus was not cut through, the *corpora lutea* made their appearance, and the womb became thicker, and the fœtuses were formed; but on the opposite side, where the uterus had been divided completely, no fœtuses were formed, but *corpora lutea* were generated, and not unfrequently, the womb was enlarged and evolved, and became filled with water. There were clear marks of a generative effect, which proved ineffectual, because the access of the semen to the rudiments had been intercepted.

"In another set of experiments, (for it seemed good to vary the circumstances of these operations,) an opening was made as before, and the wombs and the vagina were pressed through the aperture, and the parts lying within reach; instead of dividing the *uterus*, I made an incision through the vagina, about half an inch below that part where it receives the two orifices of the womb. Several of the animals died from this experiment, which is a much rougher one than the former, owing to the large size of the vagina; nevertheless, many recovered, and were put to the male, the vagina being still sufficiently capacious to admit of easy intercourse; but although, in a healthy rabbit, one single union, during the heat, seldom fails to produce generation; although in some of these animals desire seemed to remain for days together, lively and insatiable; yet never in one single instance were new fœtuses formed; *corpora lutea* were generated—the wombs, as in extra-uterine pregnancy, were evolved—the waters, as before, collected in the *uterus*—the efforts of generation were powerfully made, but the mutual access of the semen and rudiments was intercepted, and formation was tried in vain.

"But it may be objected, that sterility ensues, from the general injury inflicted on the genitals in these operations, and not from the intercepted access of the semen to the rudiments: this objection, however, as would be readily admitted by those who had seen the experiments, is rather specious than sound. If the experiments are dexterously conducted, much injury is not ultimately sustained; and I know from experiments not to be wantonly repeatedly, that wounds more severe may be inflicted on these parts, without producing sterility, provided the canal of the *uterus* is not interrupted. I once in the rabbit, divided one womb in two places, the other in three, in such manner, however, that when the parts became reunited, the uterine canal was renewed, and after the very first intercourse the animal produced as many as nine fœtuses. Be it remembered, too, that when the vagina was divided, the wombs were left totally untouched by the knife; and, moreover, that in both sets of experiments, vaginal and uterine, the formation of the lutea, the evolution of the *uterus*, and the accumulation of the fluids in the womb, demonstrated clearly, that the genital system was powerfully excited, though the excitement proved abortive. Nor must we forget that, when only one *uterus* was divided, the other, left untouched by the knife, suffered quite as much as either of the wombs did under the second set of experiments, in which the vagina only was divided, and yet fœtuses formed in the womb notwithstanding. Further, in two of the vaginal experiments, it so happened, that a reunion of the divided parts was accomplished, the two portions being put into communication again by means of an aperture as large as the barrel of a crow-quill; both these animals became pregnant, and this too, after little intercourse with the male.

" To conclude, these experiments were not single, but multiplied; they were not new repetitions, but with varying circumstances; they were not discordant, but consentaneous; and though I commenced my inquiries with a contrary prejudice, they left me under the full conviction, that in rabbits certainly, and in all animals of analogous generation probably, in order that generation may be accomplished, the semen and the rudiments must come into contact with each other.

" *Inferences to be drawn from these Experiments.—First,* From these experiments we may infer, that in the rabbit, *corpora lutea* may form independently of the full excitement of the generative actions, and, therefore, that in this animal they are not the certain evidences of impregnation. By the *corpora lutea,* I understand those appearances which, when impregnation is effected, seem to show themselves invariably in that part of the ovary from which the rudiments have escaped.

" *Secondly,* We may also infer, that mere absorption of the semen from the *vagina*, by means of the lymphatics, is insufficient for the purposes of formation. In one of the vaginal experiments, the access of the semen to the rudiments being intercepted, impregnation could not be accomplished, though the animal admitted the male as many as fifty times, mostly at intervals of two or three days, or more. This doe, a remarkably fine one of her age, was a great favourite with her polygamous husband; but it appeared, after death, that, notwithstanding all these attempts, no fœtuses could form,—the *corpora lutea* were generated,—the wombs were evolved,—the water, as usual, collected in the uterine cavities, but this was all; the access of the semen to the rudiments was intercepted at the top of the *vagina,* and impregnation could not be effected. Yet it is evident that much of the male fluid must have been deposited in the *vagina,* and absorbed by the veins or the lymphatics."—Pp. 59, 64.

The next difficult question for determination is, where do the rudiments of fecundating fluid meet? and upon this we find the following observations.

" It has often been asked, whether the male fluid ever rises up to the ovary, or whether the mixture takes place elsewhere? For myself, I am inclined to think, that, in general, the rudiments and the fecundating fluid meet each other in the *uterus;* for the formation of the *corpora lutea,* the developement of the *uterus,* and the accumulation of water in the uterine cavities, as in the experiments narrated, seem all of them to show, that the rudiments may come down into the *uterus* without a previous contact of the semen. It is certain, however, that the secretions of our sex sometimes reach to the ovaries. Ruysch, who examined a woman struck dead by a knife, when in the act of adultery, found the fluid in the Fallopian tube; and granting, what cannot, I conceive, be denied,—I mean, that there can be no full formation of the fœtus without mixture of the two substances, it is clear, that in ovarian pregnancy such deep penetration must occur. Perhaps the over-action of the genitals, and the conveyance of the semen too far, may be the exciting cause on which extra-uterine gestation depends."—Pp. 64, 65.

Dr Blundell then proceeds to consider Anomalous Impregnation, and maintains, as it is not necessary that mixture should take place in the individual who is pregnant, not only that "it is not physiologically impossible that a woman, though a virgin, should be with child," but that even "a boy may become pregnant with his twin-brother, and that a girl may become pregnant with her own brother or sister." Thus physiology, in the hands of Dr Blundell, becomes a very wonderful science, and affords deductions which must overturn all the hitherto established doctrines on this subject. Though we do not say that we deny the facts on which these strange principles are promulgated, we must be permitted to tell Dr Blundell, that we think he might have made a different use of them, and shown that the cases referred to, differ very widely, indeed, from those of genuine and regular impregnation. These, indeed, are not so much cases of Anomalous Impregnation, as Dr Blundell denominates them, as instances of *Double Aberrant Conception,* that is to say, conception in which two impregnated ova, after detachment from the ovary, and being carried into the *uterus,* become both animated and advance a certain length in the process of growth; and while one proceeds in the regular course of developement to the full period of fœtal life, the other sustains in one or more important organs, some injury, in consequence of which its growth becomes checked more or less suddenly; and while the more perfect ovum survives expulsion from the *uterus,* the other, though possessed of automatic or organic life, being void of the necessary organs, never acquires an independent or animal existence; and, becoming attached to some part of the perfect being, continues, in the form of a tumour or preternatural growth, to make part of its structure so long as its existence endures.

In this case the difference between regular and anomalous impregnation consists in this, that the regular *ovum* is detached from the *uterus* at or about the usual period; whereas it is physiologically impossible for the irregular one to be detached from the parts which serve as its *uterus,* and there it must remain till the death of the individual, which it not unfrequently occasions, or its removal by art, which is the same thing. Would this justify the inference, that a child may be formed in the womb of a virgin, as maintained by Dr Blundell? We think certainly not, in the ordinary understanding of the term impregnation. It is only by a sort of play upon words that the inference of the author can be entitled to any attention; and it appears to us, that it is making physiology almost ridiculous to admit such arguments in establishing its principles.

One of the best parts of this division of the work is the description of the progressive developement of the fœtus; and the only objection which we have to it is, that it stands not in its proper place. We must, therefore, introduce it here, in order to observe some method in our proceeding.

"If we examine the *uterus* of a rabbit immediately after the process of conception is completed, that is, at the end of the eight-and-forty hours, we can scarcely discover there any traces of the rudiments; but if we wait for a few hours longer, and examine again, we shall then, according to Haighton, detect portions of the rudimental matter lying on the surface of the womb, and which, in their number, are found generally to correspond with the number of the Grafian vesicles, which have given way in the ovaries. Pausing for a few hours longer, and then, in another rabbit, making further examination, we now perceive that these little portions of matter have begun to model themselves into something of an oviform shape each oviform molecule consisting of its two parts. The one, a membrane or little vesicle; the other, the material which this little vesicle or little membrane contains. Generation (developement?) advancing, it is found, even from observations in the human *ovum*, that the contents of this delicate cyst are separating themselves into at least two parts more; the one consisting of a lymphy water, which afterwards proves to be the *liquor amnii*, and which at this time is very small in quantity, not exceeding a few drops; the other, composed of an opaque corpuscule, not bigger than a mustard-seed, and which, by means of a very slender filament, afterwards constituting the chord, is put into connection with the cyst which contains it. Thus, then, it appears, that very early in gestation, within the first three or four weeks after intercourse, perhaps within the first two, all the essential parts of the *ovum* are generated; the embryo, the membranes, the *liquor amnii*, and the chord.

"Generation proceeding, the diminutive corpuscule of which I was speaking, enlarges considerably in its dimensions, and assumes a shape not dissimilar to that of a cheese-maggot. For it is remarkable, that, in the first stage of our existence, we bear no little resemblance to this contemptible grub. Leaving this image, however, to advance towards a likeness all-illustrious, in the course of a few days, or rather of a few hours afterwards, we begin to form the eyes. These organs, if I may judge from preparations, make their appearance laterally at the upper part of the most depending portion of the embryo on either side, in the form of light brown specks; and I suppose that about the same time that the eyes are produced, the other internal parts, as the brain, the viscera of the thorax, and abdomen, are elaborated too; neither legs nor arms being at this time perceivable. Formation still proceeding, the entire corpuscule of the embryo becomes separated into two parts,—the head, I mean, and trunk,—which are afterwards retained in connection with each other by means of a short and rather slender structure, which afterwards composes the neck,—that fair column, the seat of dignity and grace, on which the human head is erected. About this time it is when the neck is forming, that the legs and arms begin to make their appearance in the form of buds, which burge, (burgeon, we presume, is meant,—that is to say, sprout,) and in the further progress of generation, these budding arms and legs become elongated, and no long time afterwards, the fingers and toes sprout forth, the embryo, soon after these small members are completed, becoming thoroughly elaborated and accomplished in all its other parts. While this formation of the embryo is proceeding, the *involucra,* of so much importance to our welfare while in the *uterus,* are becoming organized also; and, by the time that the embryo is completely elaborated, the involucra will be found to exist in all their perfection, and we have the *placenta,* the membranes, the *liquor amnii,* and the chord; parts which, as to their essential structure, are very early constructed, first needed during fœtal life, and therefore first formed."—Pp. 133—136.

The account of the circulation of the fœtus is, upon the whole, clear, and gives a just view of that difficult and contested portion of physiology. As it forms a fair specimen of the style of the author in his graver moments, we give it in his own words.

"In the circulation peculiar to the fœtus, the blood issuing from the internal iliacs by means of the umbilical arteries, is conveyed to the *placenta,* and diffused over its substance, which it fills like a sponge, floating at length into the umbilical vein, by which it is transmitted to the *vena portarum* of the liver: this is the first stage of the circulation. The blood in the *vena porta* may, in imagination, be divided into three portions, and of those three portions two pass by means of the *canalis venosus,* from the *vena porta* of the liver to the *vena cava* inferior direct, and thence to the right auricle of the heart, while the remaining, or third portion, passes through the liver in the ordinary way, so as to reach the *venæ cavæ hepaticæ,* the *vena cava* inferior, and the right auricle of the heart; and this is the second stage of the circulation, whereby, as we find, all the blood enters ultimately into the right auricle, two portions passing into this cavity by the *canalis venosus,* and one through the liver in the ordinary way. When the right auricle contracts, of the three portions of blood mentioned, one passes direct into the left auricle, through the *foramen ovale,* and thence to the left ventricle, and the ascending and descending aorta, following the ordinary route; but the same contraction which throws one portion from the right auricle to the left, through the *foramen ovale,* impels also the two other portions from the right auricle to the right ventricle in the usual way, to be thrown afterwards out of the ventricle into the pulmonary artery, which, as every anatomist knows, is inserted into it. In the trunk of the pulmonary artery the two portions of the blood separate, the larger passing direct into the *aorta descendens* by a short and capacious tube, which leads direct from the one vessel to the other, the *canalis venosus* before demonstrated, and the blood in the pulmonary arteries flowing through the lungs into the left auricle, ventricle, ascending aorta, and *aorta descendens,* in the same manner as in the adult; and this it is which constitutes the third and most complex stage of the circulation. All the three portions of blood, therefore, ultimately reach the *aorta descendens,* though by different channels, and not simultaneously; and then, which completes the fourth stage of the circulation, this blood passes along the aorta to the common and the internal iliacs, the point from which it first issued.

"Thus, then, to recapitulate;—in the circulation peculiar to the fœtus, the blood in the first stage from the internal iliacs to the *vena portarum,* through the umbilical vessels, being diffused over the vascular part of the *placenta;* in the second stage of this circulation, this blood passes from the *vena portarum,* into the right auricle, in part through the *canalis venosus,* and in part through the liver, by the same passages as in the adult; in the third stage of its circulation, the blood enters the descending aorta by three different routes, through the lungs, the *canalis arteriosus,* and the *foramen ovale;* and in the last or fourth stage, this blood flows to the internal iliacs, from which the circuit commenced by the descending aorta and common iliacs."—Pp. 121, 122.

The changes which take place in this current after birth are next in point of importance.

"Now, when the fœtus comes into the world, it is usual to tie the umbilical chord; and in consequence of this ligature, the umbilical vessels, together with the *canalis venosus,* become no longer of service in the circulation, and therefore they become closed in conformity with the law before announced. Hence we find in the adult, that the umbilical vein is become converted into a mere ligamentous vestige, well known to anatomists under the name of the *ligamentum rotundum* of the liver. Again, when the child comes into the world, it begins to respire, and its lungs playing, the blood passes through them with very great facility; and the consequence of this is, that a large quantity of blood passing through the lungs, and a much smaller quantity flowing through the *foramen ovale* and *canalis arteriosus,* these canals first contract, and then close. The explanation is at least plausible, though perhaps not altogether satisfactory."—P. 123.

Now we marvel that a teacher of the originality of Dr Blundell did not see good reason to question whether "it was in consequence of the ligature that the umbilical vessels, together with the *canalis venosus*, became no longer of service in the circulation;" and that he did not say that the ligature of the chord had nothing to do with the business. It is certain that the ligature is not always necessary, and that in savage life, and among the lower animals, it is not applied. Is it not, we ask, rather in consequence of the great change which has taken place in the current of the circulation, by the transit of so much blood through the pulmonary artery, and by its diversion from the liver, that these vessels contract and finally close in the infant which has breathed, and continues to breathe. The blood could not continue to flow through the vessels of the umbilical chord, suppose they were left untied.

In speaking of the functions of the placenta, the author represents that organ to perform what he denominates a placento-pulmonary office; but though he shows that this consists neither in the separation of carbon from the blood, nor in maintaining the temperature of the fœtus, he does not inform us wherein the placento-pulmonary office consists.

In looking over the third part of the work, on the Signs and Diseases of Pregnancy, the author enters at much length into the consideration of the question of, What are the signs by which, in doubtful cases, a practitioner may determine the fact of pregnancy or not? The whole of the usual indications he considers with much attention, but is disposed to attach most importance to the areolar sign, upon which he descants in a manner sufficiently instructive, and not without amusement.

"If you examine the nipple in either sex, you will frequently find round it a discoloration of the skin, and this circular discoloration of the skin, sometimes distinguished by a rosy tint, and sometimes by its being of the same colour with the contiguous skin, but lighter, constitutes what is called the *areola*, a part which, in consequence of pregnancy, is liable to become changed, even from the first; for when a woman becomes pregnant, the areola may become broader and darker than it was before, and may, too, undergo a complete change of colour, the rosy or cutaneous tint becoming converted into a coppery red, or a dark mahogany brown. The change of the areola I should recommend you to study with attention; and the best mode of studying this, is not by reading or hearing, but by inspecting for yourselves. When you are attending cases in town, for instance, I would recommend you to take every proper opportunity of examining the areola; this you may do, on many occasions, without much exposure of the bosom, and, moreover, you will have occasion often to notice the areola, when the child is applied to the breast. The changes of the areola I have studied with a good deal of attention, both for your advantage and my own, and I find that they may be distinguished into three varieties, numerically discriminated according to their degree. Now, when the alteration of the areola rises to the highest point; when this part becomes broad and dark, and embrowned in fullest measure, more especially when pale before, perhaps, it changes to a deep brown, so dark that it reminds one of the skin of the negro, the indication of the areola ought to have great weight, at least, in a first pregnancy. By this indication alone, pregnancy has been not unfrequently detected. More than once I have thus discovered it myself; but, on the other hand, when the areola is changed in the first or second degree only, its indications are of little value. And when a woman has had a large family before, even though the areola be changed in the fullest manner, no certain reliance can be placed upon the sign; for experience shows that the smaller changes are indecisive, and when there has been pregnancy before, it is difficult to decide whether changes in the highest degree are to be attributed to the operation of a fresh pregnancy, or the remaining effect of those which have preceded. To be short, the areola may, now and then, deceive, when you think that there is most cause to rely on it; but (allowance made for anomalies) if the change be in full degree—if there have been no pregnancy before—if the eye of the observer be experienced—if the other signs of gestation attend—the indications of the areola are deserving of a very confident reliance; not to add, that in many cases, pregnancy may be detected by the areolar changes alone, and they have the advantage of manifesting themselves very early in gestation.

" A girl, some years ago, I was requested to interrogate, and, upon examining the areola, I declared her to be pregnant; and this she at first averred was impossible, but soon satisfied that I knew a little more about it than she was at first aware, she altered her tone, and three or four months afterwards delivery occurred. In St. Thomas's Hospital, I was also requested to interrogate a woman: she resolutely denied her pregnancy, but the indications of the areola put the matter beyond doubt, and when I made an internal investigation, I could distinctly feel the head of the child through the uterus. The woman was delivered within one or two months afterwards. I was once requested to interrogate a young lady of much talent and accomplishment, and great force of feeling. On examining the areola, I was at once convinced of her gestation, but as she denied the possibility, and would really have attested the throne of Heaven, and Him that sits upon it, had I not entreated her to be silent, an internal examination was made, when I found the *os uteri* was opening, and the head of the child was distinctly observable; parturition afterwards taking place in the course of three or four days. I really once saw a woman actually in labour, who persisted, nevertheless, that she could not be pregnant; and it may not be amiss to remark here, once for all, that in points of this kind the asseverations of the ladies ought to have no weight whatever: nor, indeed, when a denial is given, ought these asseverations to be called for, especially in the presence of a third person. Women seem to have a sort of instinctive feeling, that interrogations of this kind no man has a right to propose to them, and of consequence, that in answering such impertinence, they may say, and with solemnity too, what they please! Are the ladies the only persons who tell grave falsehoods?"—Pp. 161–163.

In the Fourth Part of the work, the author treats of the various stages of parturition and their management very minutely, and very rationally, as might be expected from a teacher of his judgment and experience. All unnecessary interference, all officious or meddlesome midwifery, as he styles such conduct, all use of instruments upon slight or trivial occasions, and all use of instruments unless upon the most urgent necessity, all force and violence, " Ferocious, Atrocious violence," as he most justly terms it, he condemns in the strongest and most unqualified terms. His motto is in all instances " *arte, non vi*," or, as he interprets it, " like men, and not like brutes." This is, indeed, one of the very best characteristics of this work, that the author, with the profound knowledge and active benevolence of an able practitioner of midwifery, seizes every opportunity of impressing upon the student the absolute necessity of knowing well the relative position of the fœtus to the parts of the mother, and of the exact state of both, and never attempting to substitute for this knowledge any airs of boldness or activity of doubtful effect, of avoiding being meddlesome and officious, and, with the preservation of presence of mind and perfect composure, of reasoning and thinking well, rather than acting precipitately.

Take the following example of an admonition in a case of breech presentation.

" The nates presenting, you are not hastily to infer that manual interference is necessary. Nor are you rashly to thrust the hand into the pelvis to lay hold of the presentation, or to thrust up the blunt hook or forceps, or to have recourse to any artificial measures,—as usual, a meddlesome midwifery is bad: interference is justified by inexorable necessity only; and, in general, the same powers which detrude the head in natural labour, will also, and perhaps with greater facility, push the nates to the outlet of the pelvis. In these cases, therefore, a principal duty of the accoucheur is to wait: put your hands into your pockets, and not into the vagina. *Pazienza*, the familiar ejaculation of the Italian, may be properly adopted by the accoucheur."—P. 367.

And again a little after he proceeds in the same strain. " Meddlesome midwifery is bad. By the people of England, the censor and monitor of nations, wild beasts are caged; but worse than these, the accoucheur, meddlesome and violent, yet responsible to none, has been unwisely let loose upon society, with all his instruments about him."—P. 377.

There is still another error against which he cautions in very strong and expressive language. Many persons seem to think that they are always right if they act according to rule; and, without thinking whether any individual rule be a proper or an improper one, providing it be dignified with the name of rule, then they calm their conscience by the recollection of the rule. Against this slavish and routine adherence to form, Dr Blundell has remonstrated at great length, especially when treating of flooding and the occurrence of pains.

" Beware of being deceived by the rule (if rule it can be called) which has deceived many,—I mean that of waiting for the pains in flooding cases. The silly rule is the title by which I would designate it; and I use the expression, though quaint, under the hope that it may become fixed upon the mind, and may, by the caution it intimates, prevent your being misled. In cases where large quantities of blood are coming away from the *uterus*, the womb becomes paralytic. The pains which were commencing leave the patient; and the larger the bleeding the less the pain, more especially in the latter months. Understand, therefore, if the want of pains is to be considered at all, that it is rather to be considered as an indication to interfere than to refrain; for you have not, I trust, forgotten, that till the womb is evacuated, the woman is never secure; and unless manual means be adopted, if the pains and uterine efforts are wanting, in the latter months especially, how can the ovum come away? You are called, perhaps, to a case in which the blood comes largely from the *uterus*. You ask the patient, and properly, whether she feels the uterine pain. No, is the reply. Will you then act upon the silly rule? Will you tell the patient, Come what may I can give no manual assistance, because you have no pain. None, I hope, will be guilty of such folly. In flooding cases, the truth is, with the pains you have very little to do; it is with the flooding, —it is with the danger, that it is your duty to contend; and from them, if possible, the woman must be rescued, whether there be pain or not. A woman sitting quietly in her apartment, being seized suddenly with a large eruption of blood from the womb, a practitioner, specious enough, but of small experience in these matters, was promptly called to her assistance. Woe be to the woman under these circumstances, who is deceived by an exterior. Have you any pain? was the question. No, was the answer. So, acting on the silly rule, without even examining whether the *placenta* was lying or not over the mouth of the *uterus*, the practitioner went his way. The flooding continuing he was summoned again, and again he acted on the silly rule; there being no pain, he still determined that nothing could be done; so he went home, and went to bed, and went to sleep!—how one envies such philosophical composure! But we bear the dangers and misfortunes of others with truly admirable resignation. In the middle of the night his repose was broken by the tinkling of his bell, the noise of his knocker, and the clamour of voices,—a third summons had arrived. To the house of the patient, therefore, he went a third time, and then he found her dead! with the child in the uterine cavity, and the *placenta* lying over the mouth of the womb; the parts so relaxed and open, that the abstraction of the ovum would have been a very easy task. Beware of the silly rule. In general, to die is no jest, nor is it a jest to die even by the kick of an ass.

"Remember, then, that in floodings, whether earlier or later, but more especially in the later floodings, if the patient be lying in a state approaching asphyxia, all manual operations are in general improper—disturb the clots, and the patient dies. Watch, therefore, nor venture to resort to the use of the hand till the return of the strength, and the copious or dangerous renewal of the bleeding may render the operation at once necessary and more secure. Remember, further, that, if you are called to floodings of the first, second, or third month, although, from such flooding often repeated, one miscarriage following another, the health may suffer severely, yet with an ordinary share of vigour in the patient, notwithstanding all our alarms, death but rarely occurs; and, therefore, manual operations not being necessary, should be rejected. It may, indeed, be sometimes advantageous to empty the *uterus* by means of one or two fingers. This I do myself, in part, because my hand is small; and in part, perhaps, because I have an overweening confidence in my manual skill. You, however, I strongly dissuade from this practice, till you have been formed by experience to the higher and nicer parts of obstetric operations. But to proceed. When called to floodings of the latter months, in which the patient, not in a state approaching asphyxia, still retains her vigour, remember, in the *third* place, that it becomes your duty to ascertain by examination, whether the *placenta* lie or not over the mouth of the *uterus*. Now if the *placenta* covering the mouth and neck of the womb, whether partially or completely, you cannot deliver by turning, you may, perhaps advantageously, puncture the membranes when accessible; but if, on the contrary, turning may be accomplished, then by this operation the *ovum* ought to be promptly brought away; not that this practice is wholly unattended with danger, but that, under the given circumstances, it is on the whole the best we can adopt. Remember, *lastly*, in latter floodings, when the *placenta* is not lying, whether partially or completely, over the mouth of the *uterus*, that, as soon as the flooding becomes dangerous, the *liquor amnii* should be discharged, and although the continuance of the flooding may now and then demand the operation of turning afterwards, yet in the majority of cases, such a necessity but rarely occurs; so that to this beautiful operation you may safely venture to confide.

"For the sake of humanity, allow me again to caution you against the silly rule. For the sake of humanity, allow me again to remind you, that, from whatever cause the flooding arises, whether in the earlier or the latter months, before or after the birth of the child, before or after the birth of the *placenta*, so long as the woman is lying in the state approaching to asphyxia, the disturbance of your hand is death. Ah, how I commiserate those unsuspecting but ill-fated victims, who are destined to perish by your forgetfulness of this caution! At this moment live the women who must sink under this mal-practice. Not to introduce the hand into the *uterus* in any case till the pregnancy is advanced beyond the sixth month is a good general maxim, though not universally applicable. Not to introduce the hand into the *uterus* before the sixth month of pregnancy is completed,—not to pass the hand into the womb, unless the disk formed by the dilatation of the *os uteri* be as broad as a crown piece, are both of them good general principles of practice, and ought to have their influence; but they are not universal. When the woman is utterly dead, the child may be abstracted notwithstanding. In alarming floodings, it is often safer for your reputation to have another opinion."—Pp. 354—358.

The circumstances requiring the operation of turning, the mode of performing that operation, and the cautions necessary in it, are very impressively described; and here again the author lifts up his voice against ferocious violence, which, he adds, ought to be exploded from midwifery. His preparatory treatment also we like much for its simplicity and efficiency; and after enumerating all the usual means, he recommends the practitioner to trust chiefly to a full bleeding of from twenty to thirty ounces, and the administration of eighty or a hundred drops of laudanum. Then after repeating his injunction to beware of impatience and violence, to beware of lacerations, and to remember that a thrust of the hand here is as fatal as a thrust of the bayonet, he sums up the whole in the following emphatic manner.

"Composure, perseverance, gentleness, patience, experience, great manual dexterity, and a thorough knowledge of the bearings of the fœtus, womb and pelvis, are requisite in the accoucheur who manages these cases. Lacerations constitute the principal danger; *arte non vi;* of more sudden violence beware, and take care too, that you are not enticed by degrees to the use of too much force, wheedled onward by the delusive and dangerous, and continually successive expectations, that one ounce more pressure will bear down the obstruction. Ah! this one ounce—only one ounce more—it is this, I fear, which often kills the patient."—P. 407.

Next comes the important subject of floodings, or rather that of their after-management, as preparatory to the grand enterprise of Dr Blundell, *Transfusion.*

After many cautions to the practitioner regarding the management of the patient in this state, and the treatment of such effects as headach and diarrhœa, weakness, aqueous effusions, the author enters on the subject of Transfusion, by pronouncing a passionate eulogium on the value of that practice, and glancing very briefly at its history.

He then proceeds to examine the circumstances which have contributed to its failure, and to specify the conditions necessary to its success. In the *first* place, the blood of one animal may be substituted for that of another of the same species; in the *second* place, the blood of animals of a different species is found by various experiments to be unsuccessful, the blood of a sheep not being capable of substitution for that of a man, nor that of a man for that of a dog; and, in the *third* place, blood may be transmitted through a syringe without much deterioration. Having established these preliminary principles, Dr Blundell proceeds to enumerate the rules which are to be observed in the performance of the operation; with regard to the exposition and opening of the vein, the withdrawing of the blood to be transfused, and the mode in which it is to be transfused. Rapid transfusion, he repeats, is injurious. The blood ought to be introduced slowly and gradually; and the operator should keep his eye steadily on the countenance of the patient, and his hand at her wrist and heart. In general, the smallest quantity as four or five, or eight or ten ounces, are sufficient; for whether we transfuse or not, reaction is apt to come on next day. The introduction of air, though to be avoided and deprecated, he represents to be not fatal; and as to inflammation of the vein, though he allows it to be what he calls "a neat topic of declamation," he tells the operator that he has no time to think about it, and that it is a mere feather in the scale,—Antipater and the *myomachia*, as he classically reminds his reader.

Then follows a short allusion to the dangers of the operation, in which the author takes care to remind the reader that no operation is altogether free from danger,—from venesection to amputation and lithotomy; and that, consequently, such arguments ought not to be allowed to influence the determination of the question. "Out of this Nettle danger," he might have said, "we pluck this Flower Safety." And last of all comes a beautiful panegyric on the immutability, the immortality, and the final triumph of truth over all her gainsayers and foes, (p. 428 and 429.)

From the 23d to the 27th sections inclusive, Dr Blundell treats at great length and with much ability of the various forms of hemorrhages—in the earlier months, the latter months, from the *placenta* being fixed over the *os uteri*, after-floodings and their treatment; and then he considers the subject of laborious parturition and its effects, often very frightful and detrimental to the unhappy patient.

In the 30th section, he enters on the difficult and important subject of the use of instruments, and devotes to it not fewer than thirteen sections, in which he certainly examines with the fullest attention the merits and demerits, the reasons for, and the objections against, all the operations proposed for saving the mother or the fœtus, or both, and the instruments by which these operations are to be performed. We feel that it is quite impracticable to analyze this part of the treatise without writing it over in a different shape; and as we think that the manner of the author, though not exactly the one of which we approve, is in many respects instructive and useful, from his forcible and impressive mode of delivering his principles and practice,—we recommend a serious perusal of these sections to all who are engaged, or likely to be engaged, in the practice of midwifery, and especially to those who have a tendency or predilection for the use of instruments in that department of practice.

Such persons will observe, that we have here an example of a man certainly very eminent both as a teacher and practitioner, who takes every opportunity of inculcating the truth, that parturition is a natural process,—that officiousness and interference are always bad and detrimental,—and that they can only be justified by the extreme urgency and danger of the case,—and that if the accoucheur carries with him his lancet, his female catheter, and a tracheal tube, he will be much more likely to be a useful member of the profession to which he belongs, and of society at large, than if his mind be constantly running on the *vectis* and *forceps*, the perforator and scoop, and all the usual instruments which have been contrived by great accoucheurs for assassinating infants in the womb. We confess that we admire the courage and candour of Dr Blundell in thus speaking the truth without ambiguity, evasion, or reserve; and we trust most sincerely that his work will be generally read, and its precepts universally adopted in practice.

In conclusion, we have only to say, that this volume contains a large body of most useful information, and which evidently bears the stamp of having been the result of much experience and reflection,—experience, we may say, rectified by reasoning, and reasoning matured and modified by experience. The notes often contain very important facts, which, with a little management, might have been introduced into the text; and, perhaps, if the latter were cleared of some of its apostrophic but rather prolix declamations, it would not diminish the value of the work.

ART. III.—*An Investigation into the remarkable Medicinal Effects resulting from the external application of Veratria.* By ALEXANDER TURNBULL, M.D. 8vo. London, 1834. p. 96.

VERATRIA, a peculiar alkaline principle found in the *Veratrum Sabadilla*, the *Veratrum album*, and the *Colchicum autumnale*, has lately been made the object of extravagant encomium by various practitioners in this country. Like *Creosote* on the continent, it has been employed in the most opposite diseases; and maladies usually reckoned beyond the reach of art, have been represented to be cured, or at least mitigated by it, in the hands of its supporters. On the appearance of a new remedy of such pretensions, those who reflect on the many wonderful cures reported to have been performed in former times by substances now acknowledged to be inert, are apt to look at it with a degree of distrust, and to listen with impatience to the praises bestowed by its patrons; and hence the frequent charges of illiberality and prejudice brought against the less credulous and more experienced class of physicians, by those, whose confidence in the powers of their art, has not been diminished by the many failures and disappointments which it is the lot of the most judicious and successful to meet with in the course of a long practice. Whether *veratria* is destined to enjoy more than an ephemeral reputation, remains to be proved. In the meantime, whatever tends to throw light on the mode of its operation must be interesting; and as the work before us professes to be an investigation into the effects resulting from its external application in a variety of cases, we shall lay an examination of its contents before the reader.

Dr Turnbull's treatise consists of an introduction detailing the properties and mode of applying *veratria*, and six chapters, each of which is devoted to a consideration of its effects in a distinct disease, or class of diseases. Of each of these it is our intention to lay the substance before the reader.

In part third of this number will be found an abstract of M. Couerbe's paper on Veratrine, from the *Journal de Pharmacie*, which renders it unnecessary here to enter into the consideration of its chemical qualities. We shall therefore merely extract from Dr Turnbull's work a passage relating to its medicinal qualities, and the mode of applying it.

"The *veratria* of commerce is nearly white in colour, and in the form of a fine powder; it is without smell, but when accidentally or otherwise brought in contact with the mucous membrane of the nose, it induces violent and even dangerous sneezing; when applied to the *conjunctiva*, it produces great irritation, accompanied by an abundant flow of tears, which does not subside for some hours. Its taste is extremely acrid, but destitute of bitterness, and it acts very strongly upon the mucous membrane of the stomach and intestines: if introduced into the stomach, it proves highly emetic and purgative, for even in old subjects a quarter of a grain acts powerfully upon the bowels; and in some experiments the effects have been so violent as to show that death would have followed the administration of a few grains. Occasionally, it appears that during the preparation of *veratria*, some of the particles floating in the air are inhaled, and when such is the case, its effects are generally purgative. M. Andral Junior found that when it was applied immediately to the tissues, violent and speedy inflammation was the consequence; that when thrown in small quantity into the veins, it acted upon the large intestine; and that when introduced in a large proportion either into the veins or intestine itself, tetanus followed. From these circumstances, *veratria* was very properly considered to be a medicine possessed of extreme activity, and it seems to have been some little time before it was thought safe to introduce it into practice; and although it has been employed by some individuals, yet such does not appear to have been the case to any great extent.

" *Veratria* has been prescribed both internally and externally. For internal use, it is given in the form of pill, or in solution, in dropsy, gout, rheumatism, &c.; and externally, it is applied either in the form of solution, or what is better, in that of an ointment made with hogs-lard; but as this last mode of using it is the one which more particularly comes under review at present, we shall confine our attention to it exclusively. The ointment may be made from ten to twenty, or more, grains of the alkaloid to an ounce of lard, and of this a piece the size of a large nut may be rubbed from five to fifteen minutes, night and morning, as nearly as possible over the seat of the disease, until relief from the urgent symptoms be experienced, care being taken to observe that the skin over which the ointment is to be rubbed be free from injury, otherwise considerable irritation of the part will ensue; and for reasons already given, the person who applies it must be careful not to insert even the smallest quantity under the eyelids."—Pp. 3, 4, 5.

Its more remarkable effects in disease are thus described:

" The first circumstance which must strike every person who prescribes the external use of this medicine, is the very remarkable difference which is found to exist betwixt its effects upon the body when so applied, and those which result from its internal exhibition. We have seen that when applied to any of the mucous membranes even in the smallest quantity, it produces the most violent irritation; and that when introduced into the stomach, it operates as an emetic and cathartic: but when rubbed upon the surface of the body to the extent of six or eight grains a-day, for several weeks, or even months together, no such consequences follow; for although the constitution has evidently, during the greater part of the time, been under the influence of the *veratria*, so far from acting in that manner, it has been observed to calm irritation, remove pain, and produce considerable elevation of spirits. The general appearance and health begin to improve, the appetite remains unimpaired, or even becomes better, the patient experiences not the slightest degree of nausea; and the bowels, instead of being acted upon in the manner in which the internal exhibition of the medicine would lead us to anticipate, are either altogether unaffected, or such a degree of constipation is induced as to render the use of purgatives necessary to keep them in their usual state.

"When the *veratria* is applied externally in dropsical diseases, the emetic and cathartic effects which result from its internal employment in these affections are exchanged for a diuretic operation so singular and beneficial, as to bring about the removal of the effused fluid in a time much shorter than it can be accomplished in by any other known medicine; and it has done so in many cases, when other means had been previously tried without avail; but in diseases unattended by aqueous effusion, no effect whatever upon the kidneys has been observed.

"The skin over which the ointment has been rubbed, even after the friction has been continued for some length of time, shows no marks of irritation; and although in certain instances a slight blush soon pervades the surface, it nevertheless vanishes in an hour or two, and the skin returns to its natural colour. When the quantity of *veratria* rubbed in exceeds a few grains, the patients generally experience a considerable degree of warmth and tingling in the part, and until this takes place the peculiar effects of the medicine do not usually manifest themselves; the circumstance, therefore, is one worthy of attention, and may serve as a criterion whereby to estimate the extent to which the friction may be carried without producing inconvenience, and also to judge of the purity of the *veratria* employed; for when, as is sometimes found to be the case, the medicine is mixed with impurities, these sensations are not produced, and its action is by no means so certain or powerful as when it is free from adulteration. This last observation appears necessary to prevent the practitioner from laying a charge of failure against it in cases where the impure *veratria* may have been made use of in compounding the prescription.

"After the ointment has been applied a sufficient length of time to put the constitution completely under its influence, the feeling of heat and tingling extends itself from the place where the friction may have been made, over the whole surface of the body, and in some instances involuntary twitchings of the muscles of the mouth and eyelids are induced; but these symptoms disappear so soon as the rubbing has been discontinued for a day or two, and no disagreeable consequences follow to the patient. The sensibility of the parts over which the application has been made is increased to such a degree as to render them peculiarly susceptible of the presence of certain stimuli, particularly electricity or galvanism. These agents have in some instances been applied with the *veratria* ointment, but have given rise to sensations so acute as to render their further employment almost insupportable, and that without the slightest perceptible alteration of the surface. It does not appear altogether necessary that the friction should be made exactly over the seat of the disease; for two cases have lately come under observation in which the individuals who rubbed on the ointment imbibed as much by the hand as proved sufficient to cure them of painful affections in distant parts of the body under which they had been labouring for a considerable length of time." —Pp. 5, 6, 7, 8.

So much for the author's general account of this medicine. We now proceed to examine its reputed success in affections of the heart, *tic-douloureux*, and other forms of *neuralgia*, rheumatism, *paralysis*, dropsy, gout, *amaurosis*, &c.

1. *Affections of the Heart.*—" The first class of diseases in which the use of *veratria* has been found decidedly advantageous comprehends many of those anomalous affections of the heart and circulating systems in which the symptoms, though sufficiently distressing to excite alarm in the patient or his friends, are nevertheless wanting in some particulars, the presence of which is necessary to make out the case to be one of confirmed organic disease. It is not intended for a moment to insinuate that any permanent advantage has arisen from its employment in cases where structural alteration has already taken place; but the result of a pretty extensive experience in such affections warrants the hope that an alleviation of the sufferings of the patients may be effected to an extent sufficient to render life not only more easy, but also to enable those who are labouring under them to pursue their necessary avocations.

" These diseases are generally characterized by difficulty of respiration, accompanied by cough, expectoration, inability of remaining long in a recumbent posture, startings from sleep, swelling and coldness of the extremities, palpitation, a rapid, small, irregular pulse, accompanied by anxiety, and a sensation of pain, or rather of constriction in the region of the heart, occasional faintness, and sense of suffocation. It has been successful even in worse cases; for one of *angina pectoris* (to be related immediately) appears to have received most marked and permanent advantage from a few rubbings with the ointment." * * * " During the action of the *veratria* the pulse increases in strength, and becomes more regular in character, the extremities return to their natural warmth, and the swelling, when any does exist, rapidly disappears; the lips also regain their usual colour, and the general health and appearance of the patient are materially changed for the better; almost at the same time the distress and anxiety which had previously existed wear away, and the sleep becomes regular, refreshing, and undisturbed; the cough and expectoration diminish daily, the faintness and sense of suffocation vanish, and the patient is in an almost incredible space of time restored to health. Although this be the usual process of the action of the *veratria* in these diseases, it nevertheless sometimes produces effects of a different kind, at least during the time of its employment. It has happened that from one application the symptoms, and particularly the palpitation, have been increased to such a degree as to render it impossible to induce the patient to submit to a second; but, what is not a little singular, the irritation has subsided in a day or two, and along with it every trace of the disease itself has disappeared. During the whole period the constitution is under the influence of the medicine, the functions are but little altered, with the exception of the secretion of urine, which is, upon the whole, more actively carried on than at former times; and this latter circumstance in all probability depends upon the existence of watery effusion somewhere in the body; a condition which appears necessary before the *veratria* can produce a diuretic effect."—Pp. 11, 12, 13.

Let us see how far Dr Turnbull's cases warrant the conclusions to which he has come. The cases of nine patients are detailed, all of whom had been complaining more or less for years, and been subjected to various plans of treatment. The first of these was " a lady, 55 years of age, short and thick set, and of a florid complexion, who seven years before was seized with what her attendants considered to be an inflammatory affection of the lungs, for which she was actively treated. The violent symptoms were subdued, but she remained in such a state, that, during winter, she was obliged to confine herself to an apartment kept at an equable temperature." * * * " Throughout the whole seven years she had constant cough, attended with scanty mucous expectoration, a difficulty of breathing, so great as to prevent her sleeping at night, or even remaining in the recumbent posture for any length of time without bringing on distressing fits of coughing: respiration very much hurried, and the lips of a purplish hue; pulse so small, rapid, and irregular, as to render it difficult to ascertain the number of its beats. Over the region of the heart, and over a great part of the anterior surface of the thorax, there was a very perceptible undulatory motion, altogether different from ordinary pulsation; and the ear, applied to the chest over the same region, distinguished the heart's action to be extended, indistinct, and undefined in its character. Along the whole length of the left arm, from the shoulder to the points of the fingers, she complained of pain, and a feeling of numbness, which rendered the extremity almost useless. This symptom had lasted about four years. There was no very marked derangement in the digestive organs. The bowels were regular; the appetite pretty good; but there existed a slight degree of flatulence, not, however, so great as to cause much inconvenience; and there was nothing very particular in the appearance of the tongue."—Pp. 14, 15.

No treatment to which she had been subjected had afforded any benefit. After using aperient medicines for a few days, which produced no alteration, " she was put under the influence of small and repeated doses of the tartrate of antimony; and along with this treatment, frictions with croton oil were aplied over the chest and down the left arm, until a pretty free eruption was brought out."—P. 16.

This afforded decided relief; but such a degree of debility supervened as to render the propriety of its further continuance doubtful; and the patient, finding that, though the cough and dyspnœa had abated, the pain still continued, refused to submit any longer to the remedies, In these circumstances, a trial of *veratria* was determined upon. " A piece, as large as a nut, of an ointment composed of fifteen grains of *veratria,* and an ounce of hog's-lard, was accordingly directed to be rubbed twice a-day over the chest and along the affected arm, five minutes each time, and the result very far exceeded the expectations formed. The first application relieved all the chest symptoms considerably. The cough and breathlessness, to a certain extent, subsided, and the pulse and action of the heart were greatly improved. The most decidedly beneficial effects, however, were produced upon the extremity: the pain and numbness had not altogether disappeared; but these symptoms were so much alleviated, as to induce the patient to state, that, comparatively speaking, she had recovered the entire use of her arm. From this time the ointment was directed to be used every evening for about ten days, and then occasionally as it might be found necessary.

" In about a fortnight from the first application of the *veratria,* the patient was able to leave her room, and walk up and down stairs with facility; and the general improvement of her health was such, that she ventured into the open air; but, in consequence of incautious exposure, the symptoms returned two or three times, though by no means with the same severity as before; and when such an occurrence took place, one or two rubbings with the ointment afforded complete relief. She is now in comparative health; her general appearance is good; the pain and numbness of the arm have entirely disappeared; the circulation is much more regular than it has been for a great length of time; the cough and difficulty of respiration are almost gone, and she can now remain in the recumbent position, and enjoy a good night's rest; and the last time I saw her, she walked about four miles without any inconvenience."

In this case, however great the alleviation may be, Dr Turnbull acknowledges that no cure can be expected.

The second case appears to have been one of aggravated dyspepsia, combined, perhaps, with hypochondriasis. The patient would seem to have made a temporary recovery at least, whether from the novelty of the remedy inspiring him with hope and confidence, we do not pretend to say.

The third patient was a lady, 36 years of age, who had suffered for " five years from palpitation of the heart, attended by considerable difficulty of breathing." The origin of the disease was a severe inflammatory affection of the chest, occasioned by cold caught during her confinement, for which she was treated in the usual manner. A palpitation, however, remained " to such a degree, as to render her incapable of taking any exercise without materially aggravating her symptoms." The following extract will enable the reader to judge of this lady's state when subjected to the influence of *veratria.*

"She has had many exacerbations arising from slight causes, and yet so severe as to render venesection necessary to alleviate the violent throbbing of her side. Her eyes are diffused, her memory much impaired, and she has a considerable degree of nervous irritability. Her breathing is difficult, accompanied by a slight cough, and a sense of partial suffocation, along with pain across the region of the heart, and down the left arm; and these feelings are materially increased by walking, or any other exertion. Her pulse is irregular and quick; bowels costive; feet generally cold; and her sleep interrupted by palpitation."—P. 21.

In these circumstances, she was put under the influence of small doses of the tartrate of antimony and blue pill; and an embrocation of croton oil was rubbed on her chest and arm, until a free eruption was produced. "So long as the patient continued this plan of treatment, and remained quiet, she experienced great relief, but the palpitation returned nearly as violently as ever upon slight exertion, and she now began to complain of a degree of debility which she had not before been subject to. Under these circumstances she was ordered to have an ointment prepared with twenty grains of *veratria* to an ounce of lard, rubbed in the usual quantity over the region of the heart for five minutes, night and morning; and, owing to the severity of the pain in the arm, frictions with the croton oil were ordered to be made along it until a raw surface was obtained, and over this the *veratria* ointment was applied.

"On the night after the first application, the symptoms were very much diminished in intensity, but the *veratria* had occasioned a degree of heat and tingling in the arm so great as to prevent her sleeping; the pain, however, never afterwards returned. In three or four days she began to take exercise without inconvenience; and, at the end of three weeks, she left town and returned home quite well."—P. 22.

The fourth was a clergyman, "fifty years of age, large-chested, robust, and of a sanguine temperament," who had for seven years been affected with severe palpitation, accompanied by a quick irregular pulse, difficult breathing, loss of voice, cough, expectoration, and most distressing sense of anxiety. Giddiness, throbbing of the neck, and confusion of intellect, occurred sometimes to such an extent as to oblige him to intermit his duties for two or three months at a time. His bowels were regular, and his digestion generally good. Small doses of tartar-emetic were exhibited, and a blister applied over the chest with considerable advantage; but a relapse followed any remission of the treatment. *Veratria* was then ordered to be rubbed in. "By making use of the frictions once every night he became gradually better, and at the end of a week considered himself quite well. He was advised, however, to continue the ointment a little longer, and then to leave it off by degrees. This was accordingly done about six months ago; and he has remained ever since in perfect health, free from any vestige of his old complaints, and fully able for the discharge of the functions of his office."—P. 23.

Case fifth is one of *angina pectoris*, in which various therapeutical agents had been employed with temporary alleviation.

Previously to using the *veratria* the patient was put on a course of medicine, which did more for the mitigation of his symptoms than all the previous treatment, so that his health was considerably restored. In these circumstances, it was determined to make trial of *veratria*, and in three days the feeling of pain and constriction across the chest had entirely disappeared. In the course of a fortnight the pulse and action of the heart became more regular; the difficulty of breathing had very much diminished; the complexion was completely changed, and exhibited signs of unimpeded circulation. In about six weeks he could walk about, and go up and down stairs without inconvenience. " As this case was one in which a cure could not be expected, the patient was left to himself, with directions to rub on the ointment whenever a return of pain or uneasiness rendered its employment necessary. This he accordingly does, and by its means is enabled to pursue his avocation with ease and comfort. Before taking leave of this case, it is proper to state, that it was one of those in which the *veratria* exerted its peculiar diuretic effects, for, during the first week it was used, no less than six pints of urine a-day were evacuated by the patient."—P. 27.

The sixth, eighth, and ninth cases detailed in this chapter were all of very long standing, and accompanied by the various symptoms of disordered digestion. These patients had all been subject to various plans of treatment, and, as well as those alluded to before, had the *primæ viæ* cleared before friction with *veratria* was had recourse to. We beg to direct the attention of the reader to this point, as, though Dr Turnbull allows no merit to any therapeutical agent except the *veratria*, we cannot help thinking that it contributed materially to the good effects said to have taken place.

Case seventh was that of a patient affected with hypertrophy of the left ventricle of the heart. The bowels were cleared out as a preliminary, and the *veratria* then applied. A temporary mitigation at once of all the symptoms was the consequence,—the continuation of which will depend upon circumstances.

2. *Of the application of Veratria in Neuralgic affections.*—In this chapter thirteen cases are detailed, illustrating the effects of *veratria* in the more important forms of neuralgia in different

parts of the body. Of *Tic-douloureux* we have seven cases, in all of which the patients had been tortured for years with the most excruciating sufferings, scarcely, if at all, temporarily mitigated by any plan of treatment adopted. All the cases were alleviated within half an hour after the application of the *veratria* ointment. In several cases the paroxysms returned, but always at greater intervals, and were invariably relieved by a fresh application of the medicine. Where any disorders of the digestive organs existed, they were corrected by the usual means. The other six cases consist of one of *hemacrania*, four of *neuralgia* in the back, and one of a painful affection in the situation of the *os coccygis*. In these the same success attended the application of the medicine. We extract Dr Turnbull's remarks on the employment of *veratria* in this class of diseases.

"The principal considerations to be attended to in the employment of *veratria* in *tic-douloureux* are connected with the part of the face, and the extent of surface in which the pain is situated, and the length of time the patient has laboured under the disease. With regard to the first of these, it has been found that in cases where the affection is not confined to one particular point, but has extended itself along the ramifications of the nerve in which it has its seat, the symptoms may be removed much more speedily, and by means of an ointment containing a smaller quantity of *veratria* than when the contrary is the case; and this probably arises from the circumstance of their intensity in such instances being much less, and from the surface under which the disease is actually situated being greater than where one spot only is affected, thereby affording an opportunity of making the application over a number of affected points at the same time. In cases, too, of long duration, there is more difficulty experienced in performing a complete cure than in those of a more recent date; but this does not appear to arise from the ointment having less power in removing the existing paroxysm in these instances than in others, for it almost always affords immediate relief, but from the habit of recurrence at stated intervals, which its previous long continuance seems to have impressed upon the disease: even this, however, may be broken through by a little perseverance; and a recovery be effected, if not as quickly, at least as certainly as in less obstinate cases." —Pp. 37, 38.

3. *Of Veratria in Rheumatism.*—Of its application in this disease we have nine cases. Some of these were in the acute stage, others in the chronic. The ointment in the "former instances was rubbed directly upon the inflamed surface, and instead of producing any additional irritation, the inflammation and swelling rapidly subsided, and the pain was quickly subdued.

"It may be a question in how far it would be useful to apply *veratria* ointment at the very outset of the inflammatory stage, for in the cases already alluded to it was not applied until the usual antiphlogistic remedies had been resorted to, and from certain facts which have been observed in its operation, it appears that the disease must have existed for a short time before the *veratria* can take any effect upon it; but further experience on this point will soon decide the question."—Pp. 59 and 60.

Where the disease is acute the proportion of *veratria* should be lessened, in consequence of the extent of surface to which it has to be applied, and the quantity used, " for in this as in other affections the strength of the ointment should always bear a certain relation to the space over which it is to be applied.

4. *Of Veratria in Paralysis.*—The good effects of *veratria* in *tic-douloureux*, and the partial paralysis which frequently attends it, led to its trial in paralytic affections occurring in other parts of the body. In the cases referred to by Dr Turnbull, " the disease existed in different degrees of severity; in two or three the patients had almost entirely lost the power of motion in one side of the body, but recovered it again by making use of frictions with the ointment over the affected extremities, and more particularly along the course of the nerves. The greater number has, however, consisted of slight paralytic affections, situated in certain muscles, existing either by themselves, or in conjunction with other affections, and especially with *tic-douloureux.*

" From the more extensive nature of the disease in the former cases, these have required the treatment to be continued for some little time; but in the latter, one or two applications have been successful in restoring the muscles to their healthy condition.

" In either instance after the frictions have been made, there is a degree of warmth and tingling felt in the parts; gentle, indeed, at first, but becoming more and more manifest at each successive application, until the nerves of the affected parts are stimulated to a degree sufficient to enable them to resume their functions."—Pp. 73 and 74.

5. *Of Veratria in Dropsy.*—" The forms of dropsy which have been submitted to the action of the *veratria*, are hydrothorax, ascites, anasarca, and dropsy of the ovaries: in all of these it has been found of service, but particularly in the first three, several cases of which have been cured by it in a week or two, even when the severity of the symptoms was such as to threaten the life of the patient within a few hours. But in the encysted form, the benefit derived from its employment is neither so great nor so quickly manifested; in a few instances, however, a removal of the disease has been brought about by persevering in the treatment, and in several others the bulk of the swelling has been materially diminished."—Pp. 79 and 80.

" Before *veratria* be applied every attention ought to be paid to the state of all the organs, upon a derangement of which, either in structure or function, the effusion may depend; otherwise the anticipated effects will not be produced."—" The same rule before laid down, as to the relation which the strength of ointment ought to bear to the extent of surface over which it has to be rubbed, and to the state of the patient, must be kept in mind, for inattention to this circumstance may give rise to want of success in the cure. As the frictions should, if possible, be made over the whole surface under which the effusion exists, and as this must vary with the situation and extent it occupies, no prescription applicable in every instance can be given, except that the quantity of the ointment rubbed in each time, should not in adults contain less than two, nor than more than four or five grains of *veratria* ; and the friction should be continued for about twenty minutes, and repeated once or twice a-day, according to the impression produced ; this in general begins to show itself in a few hours, but not in the manner in which our knowledge of the consequences following from the medicine when given internally, would lead us to anticipate."—"When rubbed upon the skin in dropsical cases, it acts powerfully upon the kidneys, and at the same time appears to have an astringent effect upon the bowels. The quantity of urine evacuated by the patient, in some instances almost exceeds belief, and might be considered as accidental, were it not that it has been observed as an invariable occurrence. This circumstance is followed by an almost immediate subsidence of the swelling, which goes on gradually to diminish until none of it is left: the patient then gains strength daily, and soon acquires his former degree of health." * * * * "In ovarian dropsy the change in the size of the tumour is much less rapid than in the other forms, and in most cases it is not attended by any great increase in the quantity of urine. The ointment best fitted for use in this particular disease is made from fifteen to twenty grains of *veratria* to an ounce of lard ; and it should be rubbed over the swelling about twenty minutes night and morning. Under this treatment the circumference of the abdomen diminishes generally from an inch to an inch and a half in the course of each successive week, occasionally remaining stationary : and the disease at length either wholly disappears, or becomes less in size, and this event is often accelerated by passing galvanic or electric shocks through the tumour at the same time that the ointment is employed."—Pp. 80, 81, 82, and 83.

In illustration of Dr Turnbull's remarks, five cases are detailed, one of *ascites* accompanied by *anasarca*, one of *hydrothorax* and *anasarca*, one of *hydrothorax*, and two of ovarian dropsy. All these had been subjected to pretty active treatment before the *veratria* was used ; and either before or during the friction aperient medicines were used, except in case second, the most remarkable, where sixty-four pints of urine were passed in four days. In less than a fortnight the dropsy of this patient disappeared, and no morbid symptom remained, except irregularity of pulse, &c. He enjoyed robust health for two years, but expired suddenly one morning at breakfast.

No *post mortem* appearances are detailed.

6. *Of Veratria in Gout, Amaurosis, and Syphilitic Nodes.*—

Of the effects of this medicine in these diseases little is said, but that little of course holds out great inducements to adopt this mode of treatment.

We have now given a very full view of the treatise before us, and, from a careful consideration of all the circumstances, our impression is, that the beneficial effects of the agent of which he treats have been considerably exaggerated. We must say, too, that Dr Turnbull's work contains but a partial view of the subject. Has the author ever met with cases in which *veratria* failed to perform the miracles attributed to it? If so, why are the unsuccessful cases not detailed? Is he not aware that the remedy has failed in the hands of some acute practitioners, when the failure could not be attributed to the impurity of the preparation? Of such cases he must have heard, and yet no explanation of them is given.

It appears to us, too, that the author has overlooked the effects which the previous or concomitant treatment, as well as simple friction, and the action of *veratria* as a rubefacient, may have had on the system.

In conclusion, we may observe, that *veratria* has been completely unsuccessful in the hands of several physicians who have made trial of it in this part of the country,—that the cases in which it is said to have proved beneficial are neither numerous nor decisive enough to establish its reputation,—and that, till farther information be given on the subject, we shall continue sceptical of its powers. However powerful, indeed, be its physiological effects on the system, its therapeutic influence in disease appears to be not greater than that of other remedial agents; and the diseases which are incurable to them, resist also the operation of *veratria*.

In addition to these objections, it continues, and will probably for some time continue, rather a costly drug; and its ambiguous or trifling influence will not as yet compensate for the great expence at which it is procured.

ART. IV.—*Pathological and Surgical Observations on the Diseases of the Joints.* By B. C. BRODIE, V. P. R. S., Sergeant-Surgeon to the King, and Surgeon to St George's Hospital. Third edition, with Alterations and Additions. London, 1834. 8vo, pp. 344.

THOUGH the pathology and treatment of diseases of the joints have been assiduously investigated and satisfactorily illustrated by many inquirers, both in this country and on the continent, during the last twenty years, we have no individual who has contributed so much by his exertions to rectify and enlarge our knowledge of these subjects as Mr Brodie. His papers in the fourth, fifth, and sixth volumes of the Medico-Chirurgical Transactions, tended in a very remarkable degree to diffuse among the profession just notions of the nature and proper treatment of those frequent and unmanageable disorders, and, by directing the attention of practitioners to the symptomatic characters of articular diseases in their early and incipient stage, and the corresponding morbid changes in the respective articular tissues, to render the treatment thereby more efficient at the only period when it can be efficient.

The subsequent publication of these papers in an enlarged and more improved form was a still greater service to this department of surgical pathology and therapeutics; and the general suffrage of the profession has long ago secured to the Observations of Mr Brodie the character and rank of a standard treatise. At the first appearance of this work in 1818 we gave, in our fifteenth volume, such a sketch of its contents as in that form and at that period was requisite. The work has since that time been so much improved by additions and alterations, that some further account of its appearance in the present edition becomes indispensable.

Adhering to the arrangement originally adopted in the first edition, Mr Brodie treats successively of Inflammation of the Synovial Membrane, Ulceration of the Synovial Membrane, a Morbid Change of Structure in the Synovial Membrane, Ulceration of the Articular Cartilages, Scrofulous Diseases originating in the Cancellary tissue of the Bones, Caries of the Spine, Cartilages in the Cavities of Joints, Malignant and other Diseases, and lastly, Inflammation of the *Bursæ Mucosæ.*

Mr Brodie commences the subject with the history of Inflammation of the Synovial Membrane, which he delivers with great accuracy and minuteness. Of this the best example is the account of the disease as it appears in the articulation of the hip-joint,—one of the forms of *Morbus Coxarius.*

"When inflammation attacks the synovial membrane of the hip, there is an evident fulness of the groin, and, in some instances, of the nates also. There is pain, which is referred, not to the knee, as in cases of ulceration of the cartilages, but to the upper and inner part of the thigh, immediately below the origin of the *adductor longus* muscle. The pain is aggravated when the patient stands erect, and allows the limb to hang, without the foot resting on the ground. It is also increased by motion, but not by pressing the articulating surfaces against each other, so that it does not prevent the weight of the body being borne by the affected limb. The pain is often very severe, yet it does not amount to that excruciating sensation which exhausts the powers and spirits of the patient in whom the cartilages of the hip are ulcerated. From some cases which have fallen under my observation, I cannot doubt that inflammation of the synovial membrane of the hip occasionally terminates in dislocation of that joint. It is easy to understand how this may happen, where the synovial membrane and capsular ligament are much distended and dilated, the round ligament being at the same time separated from one of its attachments by ulceration. The head of the femur, under these circumstances, would be pushed outwards until it had passed beyond the bony margin of the *acetabulum*, when the action of the *glutæi* muscles would draw it upwards, and cause it to be lodged on the dorsum of the *ilium*. An example of this kind of dislocation will be found among the cases which will be related hereafter."

We shall only stop here to observe, that this is the species of dislocation denominated by many continental authors *Consecutive*, and described in such a manner as not to convey a very just idea of its true nature. Thus Dzondi, in a recent number of the *Archives Generales*, has given an account of this form of dislocation, as if it were a disease new, extraordinary, and unknown. To every one, however, who has observed a few cases of disease of the hip-joint, this dislocation must be both well known, and its causes and mechanism easily understood. It is produced, as Mr Brodie observes, by the distension and swelling of the synovial membrane, and the round ligament being at the same time detached by ulceration.

" After inflammation of the synovial membrane has subsided, the fluid is absorbed, and, in some instances, the joint regains its natural figure and mobility ; but, in other cases, stiffness and swelling remain. Sometimes the swelling has the same peculiar form which it possessed while the inflammation still existed, and while fluid was contained in the joint; and we may then suppose, that it depends principally on the inner surface of the synovial membrane having a thick lining of coagulated lymph. At other times the swelling has the form of the articulating extremities of the bones, that is, nearly the natural form of the joint; and it probably arises from the thickened state of the synovial membrane. From whichever of these causes it be that a swelling remains after the inflammation has subsided, the patient is very liable to a recurrence of the disease whenever he is exposed to cold, or exercises the limb in an unusual degree, and often, without any evident reason, the pain returns, and the swelling is augmented. In those cases in which the synovial membrane is thickened, although the fluid which had been effused is absorbed, and the principal swelling has disappeared, it occasionally happens not only that a certain degree of inflammation still lingers in the part, but that it continues until the morbid action extends to the other textures; and ultimately ulceration takes place in the cartilages, suppuration is established, and there is complete destruction of the articulating surfaces. In this advanced stage, if we wish to know whether the inflammation of the synovial membrane, or the ulceration of the cartilages, has been the primary affection, we must form our judgment not from the present symptoms, but from the previous history of the case. It is, indeed, often difficult to procure a history on the accuracy of which we can rely, particularly in hospital practice; but this is of the less importance, as whatever the disease may have been in its origin, where it has proceeded so far as has been described, there is no difference respecting the treatment; and for the most part, when suppuration has taken place, there is little prospect of advantage from any thing, except the removal of the limb by amputation."

In the treatment of this form of articular disease, Mr Brodie recommends that the particular causes of the synovial inflammation should be considered. Thus, when the disease is idiopathic, whether acute or chronic,—depletion, both general and local, in the former case, and local in the latter,—and the other parts of the antiphlogistic regimen are to be put in operation. In the chronic form of the disease, he justly regards depletion by cupping as a much more powerful remedy than that by leeches, as it is both more sudden, and more efficient than the slow and uncertain depletion procured by leeches. To the latter variety of the disease, also, he regards blisters as more suited than to the former, and more effectual when applied at a little distance from the inflamed joint, than close upon the integuments by which it is invested. He justly enjoins, however, that they should not be applied unless after previous abstraction of blood, or when the inflammation is so moderate as not to demand blood-letting.

It not unfrequently happens, especially in the case of the knee-joint, that all the precautionary measures adopted are inadequate to promote resolution and prevent the effusion of fluid. In such circumstances, Mr Brodie has ventured to evacuate the fluid by puncture with the following effects.

" 1. In a thin person, if a few punctures be made with an instrument a little broader than a couching needle, by means of an exhausted cupping-glass applied over the punctures, a large quantity of fluid may be easily abstracted without the smallest danger, and with no inconsiderable relief to the patient. But while inflammation exists, the relief is not permanent, the fluid being rapidly regenerated, so that in a day or two, or perhaps in a few hours, the swelling is as large as ever. If, on the other hand, the inflammation be already subdued, the absorption of the fluid usually goes on so rapidly, that any more expeditious method of removing it is unnecessary. *2dly*, If suppuration has taken place in the joint, not in consequence of ulceration, but from the surface of the synovial membrane, a free opening made into it with a lancet will often be attended with the best effects. I have known, under such circumstances, ankylosis to become established almost immediately, and the patient to obtain a speedy cure with an ankylosed joint. The most prudent method of proceeding is to make a puncture with a needle first, and allow a small quantity of fluid to escape, so as to ascertain its nature. If it be not simply turbid serum, but actual pus, the lancet may be used afterwards."—P. 33.

After these measures have been employed, Mr Brodie recommends, if the inflammatory action continue, the usual counter-irritant agents, and finally, the absolute quiescence of the joint maintained by splint and bandage, and other means of mechanical restraint and support. Blisters and the employment of moxa, in the manner recommended by Mr Boyle, he represents to be useful in restoring mobility depending upon thickening and effused lymph, and at a still later period, friction by the hand with starch or other fine powder, or the force of a stream of hot water directed on the joint in the manner of the *douche*.

When the disease is connected with the rheumatic diathesis, Mr Brodie recommends opium and ipecacuan, *colchicum autumnale*, and mercury, in the form of calomel and opium. When it appears to be associated with syphilitic symptoms, he recommends a well-regulated course of mercury; and, if there be reason to believe that it depends upon the protracted or injudicious use of that mineral, or, where there are symptoms of affection of the bones and periosteum, he recommends the sarsaparilla as particularly advantageous. Lastly, in the form of the disease which partakes at once of gout and rheumatism, and which appears to approach to the Nodosity of the Joints, he recommends particular attention to diet and exercise,—avoiding all articles which are either liable to produce acescency or indigestion, due regulation of the alimentary canal by rhubarb, compound decoction of aloes or similar aperients, the occasional use of the acetous extract of *colchicum*, for ten or twelve successive nights, in small doses, and the long-continued use of alkaline remedies, as carbonate of potass.

The different forms of disease, and their appropriate remedies, are well illustrated by a good selection of instructive cases.

Ulceration of the synovial membrane, as a primary affection, appears not to be very frequent in the practice of Mr Brodie; and he describes only two cases of the disorder, one in the synovial membrane of the *femur* of a young lady of nine, the other in the *humerus* of a middle-aged man. In both cases purulent matter was formed in the articular cavity; and in both cases the patient sunk under the intensity of the constitutional symptoms of the disease.

In the third chapter, Mr Brodie describes and illustrates, by the history of seven interesting cases, a particular species of morbid change which the synovial membrane is liable to undergo, and which he regards as peculiar to this tissue, and depending on the same causes, and betraying the same disposition as pulmonary tubercles or cancer of the breast. To this form of articular disease, as we did not formerly speak of it, we shall at present shortly direct the attention of the reader.

This change consists in the synovial membrane losing its character of a thin transparent pellicle, and becoming converted into a thick pulpy substance of various shades of dark-red or brown, intersected by white membranous lines, and varying in thickness from a quarter of an inch to half an inch. Mr Brodie infers, that in this change a new structure is substituted in place of the natural one; and he regards it as similar to pulmonary tubercles in the ulterior changes which it undergoes. Thus, while tubercles give rise to inflammation and bronchial secretion, and themselves are dissolved in a species of spurious suppuration, this pulpy degeneration, as it may be denominated, gives rise to bloody-serous secretion, to suppuration, to ulceration of the membrane, and even ulceration of the cartilages, and occasionally fistulous openings communicating externally.

This disease is, according to the experience of Mr Brodie, most frequent in the knee-joint; and, indeed, he states, that he has never known an instance of it taking place in the hip or shoulder-joint. Mr Hodgson states, that he has met with an example of it in the ankle-joint.

Though its origin cannot be traced to any distinct cause, it is often connected with the occurrence of repeated attacks of inflammation,—another circumstance in which Mr Brodie regards it as analogous to pulmonary tubercles, *scirrhus*, and similar disorganizing diseases.

At first it gives rise only to slight stiffness and swelling, without pain; and as the disease advances, the most prominent inconvenience appears to be the mere stiffness and diminished mobility of the joint, until, in the majority of cases, it scarcely admits of the smallest motion. The shape which the swelling assumes, bears some resemblance to that which takes place in cases of inflammation of the synovial membrane. The swelling is soft and elastic, communicating the sensation as if it contained fluid; and if one hand only be employed, even the most experienced surgeon may be induced to draw this inference; but, if the examiner employ a hand on each side, the absence of fluid is distinguished by the want of fluctuation.

It is a very remarkable proof of the different degrees, in which the organic sensibility of the articular tissues is roused in this disease, that it may proceed to a very advanced stage without giving rise to pain, and that abscesses may be formed, and the cartilages may be ulcerated, before uneasiness is felt; and, even in this stage of the complaint, the pain is rarely so severe as when ulceration of the cartilages takes place in a primary form. Even then these abscesses, which are secondary effects of the degeneration of the synovial membrane, discharge a smaller quantity of purulent matter, and heal more readily, than in cases of primary affection of the synovial membrane. Notwithstanding, however, the small degree of pain, the effects on the constitution are extremely pernicious; and the patient becoming hectic, loses flesh and strength, and sinks, unless the limb be removed by amputation.

The duration of the disease varies in different cases from several months to one or two years. Mr Brodie distinguishes it from chronic inflammation of the synovial membrane by its obstinacy to the usual remedies, and by the progress of the complaint. He thinks that many of the cases so vaguely described under the comprehensive name of White-Swelling by Mr Russell and others, belong to this head.

The only remedy, it is clear, for this disease is removal of the joint. All other means act not on the disease itself, but on the secondary inflammation to which it gives rise.

The chapter on Ulceration of the Cartilages was considered at sufficient length in the article in the fifteenth volume of this Journal; and the subject need not now be resumed.

In the fifth chapter in the work, Mr Brodie treats of *a Scrofulous Disease of the Joints, having its origin in the Cancellar Structure of the Bones.*

From the cases given by the author, and the general description, it results, that in this affection the bones become preternaturally vascular, and contain a smaller proportion than usual of earthy matter, and that at the commencement of the complaint a transparent serous fluid, and afterwards yellowish cheesy matter, is infiltrated in their *cancelli.*

From the diseased bone, according to Mr Brodie, we see in some instances vessels carrying red blood extend into the cartilage, which eventually ulcerates in spots, the ulceration beginning on the attached surface of the cartilage, and proceeding slowly, while the bone, thus rendered carious, may die and exfoliate partially. As the latter process advances, secondary inflammation of the cellular tissue external to the joint takes place; and serum, and afterwards coagulated lymph is effused, giving rise to a puffy and elastic swelling in the early, and an œdematous swelling in the advanced stage of the disease. As purulent matter is poured into the cavity of the joint, and as its component tissues become mechanically distended, superficial inflammation, terminating in ulceration, takes place, and sinuous and fistulous openings are formed in the surrounding soft parts.

This account, which we have simply abridged from the description of the author, shows that the disease originated not in the bones, strictly speaking, as represented by the author, but in the medullary membrane of the *cancelli* of their articular extremities. The membrane from its extreme vascularity is particularly liable to assume the process of chronic, or what is vulgarly in this case named *scrofulous*, inflammation. In other words, its vessels becoming preternaturally feeble and incapable of transmitting the blood circulating in them, become preternaturally loaded, with slowly moving or retarded blood; serum first is effused into the *cancelli;* and much at the same time sero-albuminous fluid, which undergoes spontaneous separation into serum and albumen, the latter constituting the cheesy matter,—issues from the vessels of the membrane; and even purulent matter, more or less perfect, may at this time be secreted. As the deranged action continues, the bony partitions of the *cancelli* necessary become deprived of their usual nourishment, and are hence both less firm than natural, and more easily separated from each other by the increasing quantity of new product. In this manner not only are they detached from each other, but from the cartilage by which their articular ends are invested, and while some portions are thus rendered carious, others necessarily die; after which the new products of albuminous purulent matter and bloody serum or ichor are poured into the cavity of the joint.

The successive steps of this process we have several times observed in various instances of this disease taken at different stages of its progress. Though we do not say that the description given by Mr Brodie is positively erroneous, we cannot help thinking, that, by looking to the effects of the disease only as disclosed by dissection, without taking into account the causes of these effects, his views on this subject are less complete than they might have been. The disease makes, indeed, some approach to *Spina Ventosa.*

The treatment of this disease Mr Brodie justly represents to be somewhat perplexing. Though the process is of an inflammatory character, the ordinary antiphlogistic remedies exercise little influence upon it; and he regards it as one of a specific kind, and requiring specific remedies. Counter-irritants, also, he represents to be equally unavailing. The only means, indeed, which are of any use, according to his experience, are the rule of keeping the joint in the most perfect state of quietude.

To us it appears that one great reason of the inefficiency of remedies in this disease is the circumstance, that the inflammation of the medullary membrane has proceeded too far before remedies have been employed with sufficient energy and promptitude. If the inflammation have either given rise to much morbid product, or have interfered seriously with the nutrition of the *cancelli* and their bony constituents, if it have produced caries of part even of these bones, or death, how is it possible for remedies to act with much effect or benefit? What remedy can restore the vital principle to a dead bone, or cause a carious one, that is an ulcerated one, to assume the process of repair?

Mr Brodie in this disease, therefore, gives an unfavourable prognosis when the mischief now specified has occurred. He thinks, nevertheless, that a portion of bone felt at the bottom of a sinus, may be simply ulcerated, and may, therefore, granulate and recover. We suspect that no bone, if really ulcerated, recovers thoroughly; and we rather think, that mere inflammation of a bone is meant. We must remind Mr Brodie, that the mere circumstance of the bone being denuded and felt irregular, does not indicate that it is actually carious, or in a state of ulceration.

Mr Brodie very properly attaches great importance in the treatment of this disease, to the use of constitutional remedies, or those agents which may exercise a beneficial influence on the constitution. Of this kind are tonics, alkaline remedies, and iodine, with attention to the regulation of the alimentary canal. We are happy to observe, that, though he admits of mercurial alteratives, he considers mercury in large doses as invariably prejudicial. We believe that it had better be proscribed altogether in the treatment of such cases as these; for whatever amelioration it appears to produce, is only temporary, and in no long time the disease appears to be aggravated rather than alleviated by its use. In those cases in which it is essentially beneficial, it is generally by killing the bone entirely, and producing detachment.

Lastly, we have reason to believe, from some cases of this disease which we have met with, that, if it were always practicable to carry a portion of nitrate of silver down to the cancellated tissue of the bone originally diseased, and apply it pretty freely, it would much more frequently effect a cure than any other means known.

It is also to be remembered, that several of the cases in which the articular ends of bones have been advantageously removed of late years, belong to this class of diseases.

In the present edition, Mr Brodie has given a case illustrating the mode of treatment which he has followed of late years, and which consists chiefly in maintaining, by mechanical means, the joint in a state of most perfect immobility and quietude.

We find also at the conclusion of this chapter several observations, which make a near approach to the views given above on the pathology of this disease.

The subject of *Caries* of the *Spine*, to which the Sixth Chapter is devoted, is neither so fully nor so clearly treated as might have been expected from a surgeon of the experience and skill of Mr Brodie.

Caries of the Spine, Mr Brodie represents to commence in three different modes. The first is either in the peculiar softened, or otherwise altered condition of the bodies of the vertebræ, when the disease is similar to the affection of the *cancelli*, described in the fifth chapter. In the second mode, while the vertebræ may retain their natural consistence of tissue, the first indication of disease is in the intervertebral cartilages, which become affected by ulceration. In the third class of cases, which is much more limited, the bodies of the vertebræ are affected with chronic inflammation, of which ulceration of the cartilages is the consequence.

Now, with the greatest respect for Mr Brodie's superior knowledge and more extensive experience, we beg to ask, whether this mode of arrangement be not liable to the two objections, of being at once unnatural and illogical? Had Mr Brodie adopted the method which he has pursued, in considering the diseases of the joints generally, he would have given an arrangement much more clear and natural than the one now mentioned.

The first class of causes inducing *caries* of the spine, we conceive, is inflammation or other disease of the synovial membrane and the cartilages of the oblique or lateral articular processes. Nor is this an imaginary source of disease of the spine; for we have seen it several times, and it is a cause not unfrequent of lateral curvature. The synovial membrane becomes inflamed, and effuses sero-albuminous or purulent fluid, which distends the capsule; if this proceed, the capsule may give way, and a fistulous opening may be formed; but at all events, it is not uncommon for part of the articular process to become carious under this disease, and to be either ankylosed, or, becoming ulcerated and compressed, give rise to considerable lateral inclination.

The second cause of *caries* of the spine is that of ulceration of the cartilages of the oblique processes, which in a different mode produces the same effect.

The third cause of *caries* of the spine is that of inflammation of the medullary membrane of the bodies of the *vertebræ*, giving rise, as in the joints, to softening of the *cancelli*, infiltration of serum, purulent matter, and albuminous exudation into their interstices, and the usual destruction of the whole osseous matter, with antero-posterior incurvation. In this case, also, the intervertebral cartilages may be destroyed.

The fourth cause of *Caries* of the spine consists in a primary affection of the intervertebral cartilages, which first enlarge, and then become preternaturally soft, while their solid matter is dissolved in a process of suppuration.

The spine may still become carious in consequence of disease of the spinous processes, and more especially in consequence of some disorder of the *ligamenta flava.*

We regret to remark, that in the present edition the delineations with which this part of the subject was illustrated are not given.

The seventh chapter is devoted to the subject of *Tumours and Loose Cartilages in the Cavities of Joints.* On this subject, the author has entered at much greater length than in his first edition, and has given several interesting practical illustrations of this painful disorder.

Under the head of *Malignant Diseases of the Joints,* Mr Brodie in his eighth chapter gives a case of cancerous disease affecting the head of the *femur,* and another in which the same degeneration affected the *vertebræ,* a case of *fungus hæmatodes* of the *femur,* and a case of *enostosis* of the head of the *tibia.*

In the ninth chapter, on *Some other Diseases of the Joints,* we find cases illustrative of inflammation of the *periosteum* and medullary membrane (Case 76th); cases illustrating absorption of the articular cartilages, as it occurs in the persons of the aged; and cases of the nature of *neuralgia* attacking the joints, with some observations showing the effects of gout.

In conclusion, though we do not adopt all the views of Mr Brodie on the pathology and therapeutics of the diseases treated in the present volume, and though there are some points upon which some rectification might be properly attempted, we feel that it is merely just to say, that this, as a useful practical treatise, is the most complete on the subject extant, and we must recommend its attentive perusal to all those surgeons who wish to understand thoroughly the diseases incident to the articular tissues.

ART. V.—1. *A Treatise on Indigestion and its consequences, called Nervous and Bilious Complaints; with Observations on the Organic Diseases in which they sometimes terminate.* By A. P. W. PHILIP, M. D., F. R. S. L. & E. Seventh edition, 8vo. London, 1833. Pp. x. and 231.

2. *On the Influence of Minute Doses of Mercury, combined with the appropriate Treatment of Various Diseases, in*

restoring the Functions of Health; and the Principles on which it depends. By A. P. W. Philip, M. D. &c. 12mo. London, 1834. Pp. 112.

In the seventeenth volume of this Journal, the first edition of Dr Philip's work on indigestion was reviewed at length, and, as his opinions remain unchanged, we do not judge it necessary to notice them again.

Of the second treatise, the title of which is prefixed to this article, it is impossible to speak in a very satisfactory manner. In almost every page the author's peculiar opinions, physiological and pathological, are inextricably mixed with the more immediate object of the treatise, so that to enter into any discussion on the subject would be in fact to review the author's former works. In these circumstances, all that we can lay before the reader is a brief abstract of the contents, accompanied by such extracts as may explain the views of Dr Philip on the influence of minute and frequently repeated doses of mercury in various diseases.

> "Large doses of mercury cannot be repeated at short intervals, without often rendering the remedy as pernicious as the disease, and sometimes more so, and when they are given at distant intervals, the effect of one dose is frequently lost before another is taken, so that it often happens that little or no progress is made in the cure; and there is nothing but temporary relief to compensate for the debilitating effects of each dose; while, with respect to the minute doses, although each dose does little, this little it does without any strain to the constitution, and the next dose comes before the effect is lost, so that a gradual accumulation of the beneficial effects is obtained, and that if the circumstances I am about to point out be attended to, without any injurious effects to deduct from it. The part affected is thus gradually solicited to resume its functions, and though, slowly, at length effectually restored."—Pp. 2 and 3.

After stating that he has endeavoured to avoid all prepossessions, and to confine his attention to the results of actual experience, and after reprobating the two opposite modes of practice, that of giving excessive doses of mercury, and that of rejecting it altogether, he thus proceeds.

> "It is remarkable that, notwithstanding the general and long-continued employment of mercury, it should not have been known that all its constitutional effects, not excepting complete salivation, may generally be obtained by such doses as a half or even a third part of a grain of blue pill taken three times a-day; that is a dose only equal to the twentieth or thirtieth part of a grain of calomel; for a grain of calomel is equal, whether we regard its purgative, or when divided into minute parts, its alterative effects, to ten grains of blue pill.

"If such be the case, what should induce us to employ larger quantities, except the disease requires a more rapid effect than can be obtained from such doses, or from some peculiarity in it, or the habit of the patient, the sensibility to their effects is impaired." * * * "To chronic disease minute doses are peculiarly adapted. A disease which has become habitual, can only be counteracted by a remedy, which, without injury, may be rendered habitual also; and in acute diseases, although they are not sufficiently active to effect the cure, we shall find them in many cases essentially aiding the more active, and consequently injurious, means, and enabling us to lessen their extent and continuance. The most advantageous employment of mercury, however, is not the only object of the present publication; it has another so intimately connected with a medicine of such a general application that it will soon appear to the reader that it is impossible to separate them; namely, the extensive influence of the laws of sympathy in regulating the phenomena of disease, and consequently the operation of the means which relieve them. It would not be difficult to show, that on the power of sympathy the phenomena of general diseases wholly depend, and all internal local diseases may be so simulated by their corresponding sympathetic affections, that there is often great difficulty in distinguishing them,—a difficulty not a little increased by the constant tendency of the sympathetic to change into the real disease, which frequently, in regulating the treatment of the different stages, renders morbid dissection itself, in general our surest guide, fallacious"—Pp. 4, 5.

Dr Wilson Philip divides his work into three chapters. In the first he treats of the *modus operandi* of mercury; the second contains observations on the *modus operandi* of minute and frequently repeated doses of that medicine; and the third is devoted to the consideration of the cases to which the minute and frequently repeated doses are applicable, and the circumstances to be attended to in their employment.

1*st*, *Of the modus operandi of Mercury*.—According to Dr Philip, this medicine acts in two ways, locally and generally. Its general operation is of two kinds; it operates on the system through the medium of the nerves of the part to which it is applied, and by its being absorbed and circulated with the blood. It is by its absorption that it most effectually influences distant parts, for, while circulating with the blood, it is immediately applied to the various organs, and acts directly on them. It acts more or less as a stimulant, for it causes increased performance of the functions of any organ to which it may be directed. In a metallic state, like other metals, it is inert, and it is in consequence of its being reduced to this state by the agency of the vital powers that it is ever deposited in the cellular substance: for, so long as it retains the active form under which it was introduced, it is incapable of remaining in the system. When taken internally, it is doubly applied to the bowels, first locally, and secondly, through the medium of the circulation; "for we have often to contend with its irritating effects on the alimentary canal, when it is introduced by the skin." In the alimentary canal and salivary glands alone does its passage excite sensible irritation, which, when considerable, causes inflammation. In both cases, the natural secretion of the parts is generally increased, and this increased discharge tends to relieve the inflammatory action. When the discharge is least, the inflammatory tendency is greatest.

Such, according to Dr Philip, are the more prominent effects of mercury when introduced into the system. The subject, however, is pursued further, but it is so interwoven with the author's opinions on various subjects, as to render it impossible to discuss it within the limits of the present article.

The injurious effects of mercury arise either from an excess of its stimulaut, or from its sedative powers. The former causes extreme irritation; the latter tends more directly to impair the powers of life; and these effects vary in degree, according to the quantity and form in which it is administered, the nature of the disease, and state of the constitution.

To compensate for these injurious tendencies, it possesses some extraordinary beneficial powers. The first which suggests itself is its power of stimulating the various secreting surfaces, by which many diseases must be relieved, "especially those attended with a general failure of power in these surfaces." But as this failure of power in secreting surfaces is generally but the secondary part of the disease, it is quite evident that if the beneficial effects of mercury were confined to restoring the secretions, the relief would be but temporary and imperfect. It must, therefore, possess some other virtue than the mere power of stimulating the secreting surfaces. This consists in its influence over the liver. "It is not surprising that a medicine, which so powerfully influences the secreting organs in general, should influence the secreting power of this organ; but, independently of this effect, it has a specific operation on the liver, a power not merely of exciting its functions, but of correcting the various derangements of that function in a way which it does not possess with respect to any other organ, and which no other medicine possesses with respect to the liver: and that even to such a degree as not only to restore a healthy state of the bile in various deviations of this fluid, but often to correct the most formidable change of structure in the organ which secretes it."—Pp. 13, 14.

The sympathy between the stomach, liver, and *duodenum*, is so great, that whatever injures or relieves the one has a similar effect on the other; and thus, though mercury has no direct power of relieving the affections of the stomach or *duodenum*, it often indirectly removes derangements of the organs which depend so frequently on a disordered action of the liver. It is almost unnecessary to add, that whatever directly or indirectly influences the digestive organs must possess great power over disease, as there is scarcely any derangement of health in which they do not participate, or over which they do not exercise some control. One of the principal causes of the sympathy of the digestive organs is the sympathy of the liver with the brain, "in consequence of which all the affections of the one are immediately felt by the other." The brain directly influences the action of the heart and blood-vessels to their minutest ramifications, and the secreting, and other assimilating processes, are wholly dependent on it and the spinal marrow.

"These are fruitful sources of the influence of the liver in diseased states of the system: but even these are not its only sources. All other parts receive their blood directly from the heart; it receives the principal part of its blood from the other abdominal viscera. It is thus also, as well as by its sympathy with the brain, intimately connected with the whole tract of the alimentary canal, the internal surface of the body, and through it in consequence of the intimate sympathy which exists between it and the external surface also. No affection of either can take place without more or less affecting it through both the nervous and sanguiferous systems, and by the state of these surfaces, more than any other cause, the phenomena both of health and disease are influenced. The great extent of the liver is also to be ranked among the causes which contribute to its influence in the animal economy, in consequence of which, whatever influences the distribution of the blood in it, more or less influences its distribution in every other part. Such are the conclusions respecting the influences of the liver, to which we should *a priori* be led by a knowledge of the structure and functions of our frame, and they are amply confirmed by direct observation."—P. 16.

In most formidable diseases, general or local, the function of the liver is more or less disturbed, and on the state of this organ will depend more or less the proper treatment of the disease. It not unfrequently happens that disorders of vital organs are intractable till the accompanying derangement of the liver has been removed, and hence it happens that in warm climates, where the sympathies are so active, and almost every disease, whether acute or chronic, involves it, affections of this viscus become a leading feature of almost every disorder, whether acute or chronic. Impressed with these views, Dr Philip in every case, whether acute or chronic, has been in the habit for many years of examining the region of the stomach and liver with as much care as he examines the pulse.

The beneficial influence, then, which mercury exerts over the liver, and through that organ over the system, has led practitioners to employ it to too great an extent, by which serious mischief has been done, and the remedy brought into disrepute with many, who, to avoid this evil, have run into the opposite error of not using it at all. The result of Dr Philip's experience is that, though in some circumstances large doses of mercury may be highly advantageous, the quantity employed in this country has been in the whole at least ten times greater than was necessary to obtain its beneficial effects.

In a large proportion of cases, its most beneficial employment is not that which produces its most immediate benefit, and hence, in attempting to hurry on and grasp too much, the advantage is not only lost, but what was intended as a remedy does positive mischief.

"It is a law of its action, that when it is directed to one outlet it is less inclined to pass by others; thus, when it is rapidly passing off by the skin, which is known by the scarcity of urine—if, in consequence of taking cold, or an increased quantity of the medicine, it is thrown on the salivary glands, the usual secretion of urine is restored, indicating that it is no longer powerfully exciting the skin, or perhaps increased, for the salivary glands affording but a narrow outlet, it still in part tends to pass by other channels. It seems to be on this principle that salivation renders it more powerful with respect to the disease; and particularly that diuretics, which did not previously excite the kidneys, have now this effect; but mercury seldom produces salivation, unless the system be highly impregnated with it, and then—to say nothing of the irritation occasioned by the salivation itself, which is often great—its sedative effect is frequently much felt, and the whole powers of the constitution are, for the time, enfeebled by it."—P. 19.

Although in general salivation does not take place till the system is much impregnated with mercury, there are constitutions in which the smallest dose affects the salivary glands. Dr Philip gives one instance where a quarter of a blue pill produced salivation, and another where the eightieth part of a grain of calomel produced symptoms of irritation and depression. The reverse of this, however, sometimes occurs, and there are patients who bear an excessive use of this medicine without injury, of which he gives a remarkable instance, which our limits will not permit us to quote.

The greater efficacy of a few grains of calomel, given some hours before a purgative, over the same quantity given along with it, Dr Philip attributes to the longer continuance of the local stimulus, by which the sympathy of the liver is longer excited. The alleged safety of twenty and thirty grain doses of calomel, he explains, by supposing that the rapidity with which they were carried off, compensated for the largenesss of the dose.

The author makes some practical observations on the several preparations of mercury exhibited internally, on the advantage that sometimes arises from suddenly exciting the liver and alimentary canal, and points out the danger of continuing the practice " after the due distribution of the blood is restored, and the vessels of the liver emulged," unless a recurrence of the symptoms call for a repetition of the medicine. If this should occur often, each active dose is less beneficial than the preceding, the debilitating effects increase, and soon more than compensate for any advantage that may be derived from its exhibition. Nothing then remains, but to enter upon a less active plan, and sometimes to lay aside the remedy before the disease is subdued. If the disease be active, and such as requires the free exhibition of mercury, all chance of recovery is gone, but if the disease be chronic, time may be given to try the effect of small and frequently repeated doses. By giving small doses, the debilitating effect is less, and though in each particular dose the medicine is rendered in a certain degree less effectual, upon the whole, it is not so, because its sedative power is lessened, and its stimulant and only wholesome operation is increased. The great advantage, however, gained is, that the medicine can without injury be repeated more frequently, and, however small the beneficial effect of each dose may be, if another can be exhibited before the effect is altogether lost, ground is gained at every step.

2d, Of the modus operandi of minute and frequently repeated doses of Mercury.—In this chapter, Dr Philip repeats the doctrine, that all agents capable of affecting the living animal body, act both as a stimulant and a sedative, according to the quantities employed, and that " we call them by one or other of these names, according as they are best fitted to produce the one or other effect." In mercury, the stimulant and sedative effects are nearly balanced ; in small doses the stimulant prevail, in excessive doses the sedative ; and moderate doses repeated, unless at very distant intervals, generally produce more or less the latter effect. But there is a dose so small, as to produce little or no sedative effect, while the stimulant effect in which its virtue depends is secured,—" a dose from which, in most constitutions, the sedative effect either does not take place, or takes place so slowly that the cure may be far advanced before the patient begins to experience any degree of it." The amount of this dose varies from half a grain of blue pill to an eighth, and the interval from six to eight hours. By such doses given at such intervals in most constitutions for a considerable time, in some for an unlimited time, the stimulant can be got without the sedative effect, and thus the whole benefit can be obtained without any bad consequences. From ample experience, the author maintains, that in all cases, except where great discharges, or other rapid effects of this medicine are required, minute and frequently repeated doses are not only the safest, but the most effectual mode of exhibiting it. "Their operation appears to be that of a gentle, but constant stimulant, exciting to due action the various organs of assimilation and particularly the liver." The principle upon which they are so powerful is, that, "from their little aperient tendency, they readily enter into the system, and, from the little irritation and excitement they occasion, they are not apt to be thrown off by it." By such doses the peculiar effects of mercury may be obtained in any degree. What causes minute doses to produce an effect on the gums when large doses fail, is, that the latter, by their great power of exciting the excretories, are thrown off in certain constitutions as fast as they are taken, while the former, by being thoroughly received into, and retained in, the system, make a general, steady, gentle impression, productive of the best consequences.

3d, *Of the Cases to which the minute and frequently repeated doses of mercury are adapted, and the circumstances to be attended to in their employment.*—This chapter is divided into three sections. The first is devoted to the consideration of the employment of minute and frequently repeated doses of mercury in chronic diseases, the second to an investigation of the process by which organic disease is established, and the third to the consideration of the employment of minute and frequently repeated doses of mercury in acute diseases. In this chapter, we are continually referred to the author's former works, so that it is impossible to offer any remarks on it, without going into a discussion of Dr Philip's views of the animal economy which would far exceed the limits of a notice of this description. We must therefore refer the reader to the treatise itself, in which he will find ample matter to repay him for the patience which he may exercise in the perusal.

In conclusion, we observe, that the great faults of the book are a want of precision, a continual turning aside, and hunting down of every subject that may cross his path, and the want of lucid order. The book, notwithstanding, might have done credit to a young or mediocre writer; but, from an author of Dr Philip's celebrity, more, we shall not say with what reason, is required; and we are afraid that the present treatise, though it may not detract, will at least add nothing to the long-established and well-earned reputation of the author.

ART. VI.—*On Dentition and some Coincident Disorders.* By JOHN ASHBURNER, M. D. Member of the Royal College of Physicians, Physician-Accoucheur to the Queen Charlotte's Lying-in-Hospital, &c. London, 1834. 18mo, Pp. xii. & 235.

WERE we inclined to dedicate these pages to the mirth, rather than to the information of the reader, there would be little difficulty in selecting materials from the work before us. Anormal dentition monopolizes the author's attention, and, whatever may be the disease of childhood or youth, unless it be contagious or epidemic, which he is called upon to relieve, a minute examination into the state of the teeth and jaws, followed by the extraction of a tooth, or at least scarifications of the gum, invariably forms part of every plan of treatment. If he be consulted regarding warts on a boy's fingers, he immediately looks into the patient's mouth, and, finding a tooth set not exactly as it ought to be, orders its extraction, and the excrescences forthwith disappear. Should a chlorotic girl, whose wisdom teeth have not appeared, be brought to him, the gum is scarified, or a tooth extracted, to make way for its expected fellow ; and straightway the bloom of health decorates the patient's cheek, and graceful symmetry is conferred on her person. Too long have men been deluded with the vaunted feats of bolus, pill, and potion. A new light has burst in upon us. The tooth-key and gum-scarificator are not only the great healing instruments, but the infallible preventives of some of the most intractable diseases which afflict humanity. Farewell, a long farewell, to all the glory of the physician, and the profit of the apothecary. The chemist's occupation is gone. The dentist is installed high priest of Esculapius, and all that is left to console the present sable attendants of the sick is a mournful *fuimus.*

To speak seriously, the book has three great defects. In the *first* place, one favourite notion wholly occupies the author's mind, and to the support of this one notion, every thing is forced to contribute. In the *next* place, simple, self-evident, or at least admitted truths, are made to assume the appearance of recondite propositions, by being enveloped in abstruse and almost unintelligible language, and this obscurity of style is carried sometimes so far as to render it difficult to ascertain the author's meaning. *Lastly*, we have inflicted upon us, many new words which are barbarous in the extreme, such as *anormality*, *irregulate*, *anormalize*, &c. It seems to be considered by many authors as by no means necessary to write good intelligible English.

The object of Dr Ashburner is to show, that a disordered "course of growth in the teeth and jaw may be attended by very serious or by very slight consequences; that these vary in degrees; and that they may vary according to the susceptibility of the individual, or according to the extent of irregularity in the course of growth. It is endeavoured to be shown, that if in a child's mouth, or indeed in the mouth of an older person, a due process of absorption does not go on when it ought,—that if a proper growth does not take place as it should do, and, consequently, that, if certain teeth do not appear at their correct epochs, or another set fall out when their proper periods are arrived; and that, if others do not take their stations, being obstructed or otherwise diverted from their regular course of growth, *one* or *more* of certain serious consequences may supervene. Among such can be enumerated blindness; squinting; deafness; stammering; St Vitus's dance; epileptic and cataleptic fits; various forms of nervous and painful disease, commonly thought of as tic (douloureux?) and hysterical affections; several diseases of the skin, especially nettle-rash, warts, scalled head, ringworm; some bowel complaints, some fevers, and the disease which is an union of most of these, commonly called water in the head."—Pp. 10, 11, and 12.

The treatise consists of two parts. The first is devoted to what the author calls "a view of the physiology of normal dentition," the second to an account of "the *inconveniences* resulting from anormal trains of growth on the teeth and jaws." On the first part it is unnecessary to dwell. Suffice it to say, that in this portion we meet with no view which can lay the least claim to novelty. All that we have is the enunciation of several evident or common-place propositions, and an abstract of the opinions of various authors regarding the period and mode of developement of the teeth, mixed with observations on matters slightly if at all connected with the subject.

The second part contains the author's views of the effects of anormal dentition. These he divides into local and general. The local inconveniences he merely enumerates, devoting the rest of the volume to those arising in the frame generally. It is in this portion of the treatise that we meet with most obscurity. It is difficult sometimes to understand how far the author believes certain constitutional affections to depend on anormal developement of the teeth and jaws. In the title-page, and in several passages, he alludes to them *as coincidences*, and in one passage, goes the length of saying, that "if the proposition had at any time been put forth, that anormal states of dentition were invariably and immediately the *causes* of several disorders of health, a doctrine would have been advanced, which the experience of most medical men would have enabled them to subvert at once. The country practitioner especially would instantly put the negative upon the assertion; for in his experience, unless the district in which he practises be a marshy country, or have circumstances about it depressive of the vital forces, anormalities in developement are, for the most part, compensated by the energy which a pure and invigorating atmosphere communicates to the nervous system. In the country, obstacles to the normal progress of growth in the teeth and jaws, may, and occasionally do, interfere; but the force of the constitution are in most cases sufficient to overcome the inconveniences resulting from them. In London, and in large towns, it is different; errors in the progress of growth communicate their influence to various organs; and, according to the tendencies of the constitution, according to the idiosyncrasies of the individual, or according to the condition in which surrounding circumstances may have for the time placed him, the mischief, which may vary certainly in degree, as felt in one set of organs as in another."—P. 89.

It is quite clear from this passage, that he gives up the case as far as regards the country, unless there should be something connected with the locality tending to depress the vital powers. In other parts of the work, however, no distinction is made between town and country, and the *inconveniences* are spoken of as the consequences of an anormal developement of the teeth and jaws.

This, however, is not the only inconvenience which we encounter in endeavouring to analyse the work before us. A certain haziness of style, if we may use the expression, frequently renders the author's meaning so very obscure as to be with difficulty guessed at. In these circumstances, that we may as much as possible avoid misrepresentation, we shall make use of Dr Ashburner's own words as far as our limits will permit.

The following will convey to the reader a notion of the author's style and doctrines. After remarking that anormal developement in one part is often linked with errors, in other parts, which may be either trifling or "may entail consequences of vast importance," and that hence the anormalities attendant upon dentition will be found not to be confined to the period of childhood, he thus proceeds. "It will be found that most of the complaints of children can be grouped into one family; that they can be classed under one general head; and that, for the most part, they form the symptoms of one disease, the existence of which depends upon irregularity, upon anormality of growth. It is not intended to confound the specific diseases arising from contagion, with the symptoms of irritation arising in the progress of faulty growth." * * * "Most of the complaints afflicting children are referable to cerebral or nervous irritation, the various symptoms of which are parts of the disease called *hydrocephalus acutus*, or water in the head. The manifestations of irritated nervous centre, constituting this morbid state, it is proposed to consider, as our illustrations may permit, separately. The start in sleep; the moaning in sleep; the shivering fit, the slight thrill, hardly a rigor; the flush of countenance, drowsiness, heat of skin; perspiration, neuralgia; spasmodic twitchings of certain muscles; continued spasm of certain muscles; squinting; wry neck; locked lower jaw; spasmodic croup, intussusception; chorea; epilepsy; catalepsy and its minor degrees, appalment, forgetfulness, nervousness and stammering, tetanus and coma, diarrhœa and costiveness, deafness and amaurotic blindness, are parts of hydrocephalus. What is the object in regarding these in their disintegrated state? To show that either in a lighter or a severer degree each one or more of these conditions of irritated nervous centre may be coincident with anormal dentition. This is a new mode of regarding acute water in the head; but are these the only views that offer themsleves from the point of aspect we have chosen? We know that the skin, its appendages, and the mucous or villous surfaces of the body, are closely knit together in the analogies which they offer, and that irritations to the nerves connected with one part of their systems are curiously responded to by disordered conditions of some other parts. There is a medium through which the message is made to travel. The nerves proceeding from the numerous surfaces of the intestines take their course to the brain, where they are intimately associated with nerves arriving from either some part or parts of the skin. In variolous diseases, in hydrophobia, in syphilis, and in some other conditions of irritation, or poison applied to the villous part of the skin, there would appear to be a process carried on under the direction of certain laws, which would seem to imply a connection of an intimate nature between the dermoid organs and the nervous centre; an alliance vaguely and loosely expressed by the word sympathy."—Pp. 82, 83, 84, 85, and 86.

In stating the fact, that anormal dentition in infancy is frequently accompanied by various affections, local and general, it was quite superfluous to adduce cases in support of the assertion, as most medical students who have attended a dispensary must have met with many. It is not, however, the same when Dr Ashburner promulgates his notions regarding the evils "coincident" with second dentition. It was certainly necessary that here we should have clear and unequivocal proofs, because upon the establishment of this portion of his doctrine depends any merit which he can claim for his treatise. Let us then direct our attention to the cases which he has adduced. They are in number twenty-eight, of which very few bear at all upon the matter.

The first was a boy twelve years of age, who "was cutting the second or posterior molares of the upper jaw, before those of the lower." He was affected, first, with twitchings, then with chorea, and at last, after three months' illness, fell into an epileptic fit. Dr Ashburner, on putting his fingers into the boy's mouth, found a large cartilaginous space on each side behind his first molar teeth. He "succeeded in gashing these parts," the patient "uttered a scream and fell out of his fit, becoming quite sensible, nor had he a recurrence of his chorea." Now, in this case, we would remark, that there is nothing narrated which shows in the least that this boy's illness was owing to dentition.

We find, that after he became affected with chorea, " being a very nervous lad, if any notice were taken of him, he would quite involuntarily make the most extraordinary faces, and contort his body into various attitudes that appeared to be most difficult and painful;" and during the three months that this continued, a variety of medicines were swallowed. We are not informed what these medicines were, nor whether any mode of treatment was had recourse to after Dr Ashburner " succeeded in gashing" his gums; and, in these circumstances, it appears to us that we are justified in considering this case as affording no support to the author's doctrines.

The second case is that of a boy twelve years of age, who, after being afflicted with chorea, became subject to epilepsy. In this there is not a single symptom which can be tortured into a support of the author's views. Dr Ashburner himself says, that, " though much medicine was swallowed, nobody thought of the probability of his cutting teeth." All that he rests his case upon is, that the lad's father " said he had no fits for four years; he supposed he had *outgrown them.*"

We pass over the next three cases, the symptoms of all of which may be accounted for on ordinary principles, and address ourselves to the following, which we give in the author's own words.

" I was called to the groom of a gentleman residing in Davies Street. The man was early in the morning endeavouring to mount the box of a break, and, with the reins in his hands, fell down in a fit. He was lucky in having Mr Parrott of Mount Street, called to him directly. *He was very properly treated,* and consciousness soon returned; but it was found that he was paralytic on one side. *He was freely bled and purged,* and the power of his side was quite restored in a couple of days; but though he understood all that passed around him, he could answer only " yes" and " no" to questions put to him. I observed that he had a supernumerary incisor tooth, which appeared to crowd his mouth. Every tooth was tightly wedged against its neighbour. In looking into his mouth there was found to be a sad decay of the double teeth. I prevailed upon Mr Parrott to remove seven of the remainder of these, under the idea, that they might be acting as irritants to the nerves of the jaw. At my next outset I was glad to find that the man was recovering the use of his speech. Several months afterwards I learned that he was quite well, and had no recurrence of his fit."—Pp. 102 and 103.

Now, can any man unprejudiced by system attribute the cure in this case to the extraction of the stumps of the decayed teeth? In the *first* place, Dr Ashburner admits that the patient was properly treated at first, and afterwards " freely bled and purged," on account of the hemiplegia which remained. In the *second* place, the power of the side was restored in two days; and we are entitled to infer, that the power of speech would have returned also, though none of the decayed teeth had been extracted. There are in the narrative of the case considerable omissions. We have no account of the patient's habits, nor of the state of his constitution; and certainly, when credit is claimed for a new plan of treatment, it is not too much to expect that every thing connected with the case should be fully and fairly stated. *Thirdly*, how many instances do we know in which the teeth are wedged against each other, and speedily decay without giving rise to the effects here attributed to them?

The next two cases in the book were treated in the usual way; and though in both the author attributes the patients' complaints to the state of their teeth, there is nothing in them which may not be accounted for on ordinary principles. But why should we pursue the subject further? We have already placed before the reader more than sufficient to enable him to judge of the tenor of the book. We trust that the next time we have occasion to notice a book of Dr Ashburner, we may find his experience applied to the support of some more tenable doctrine than he has now laid before us, and that he will hereafter avoid periling his professional fame by adopting an opinion, which, however ingenious, will not stand the test of examination.

ART. VII.—*The Anatomy and Physiology of the Liver.* By FRANCIS KIERNAN, Esq. Member of the Royal College of Surgeons, late Teacher of Anatomy. 4to. London, 1834. (Philosophical Transactions of the Royal Society of London for the year 1833, Part ii.)

IT is proposed in this article, without prefatory remark or comment of our own, to lay before the reader an abstract of some of the most interesting portions of the essay before us, which was thought worthy of appearing in the Transactions of the Royal Society of London.

The paper embraces a description, 1*st*, of the Lobules of the Liver, the manner of their arrangement, their connections with each other, and with the vessels; 2*dly*, of the Surfaces of the Liver, and the distribution of the vessels; and 3*dly*, of the Structure of the Lobules.

1*st*, *Of the Lobules.*—The hepatic veins and lobules, Mr Kiernan compares to the trunk, branches, and leaves of a tree. The lobules may be compared to the leaves, their substance being arranged round the minute branches of the veins like the parenchyma of a leaf round its fibres. The minute vessels terminate in others resembling the branches of a tree, and these by their union with each other form the trunks. The hepatic veins may be divided into two classes, 1*st*, the intralobular branches, one of which occupies the centre of each lobule, and receives the blood from a plexus formed in the lobule by the portal vein; and *2d*, all the veins contained in canals found by the lobules, among which may be reckoned numerous small branches, as well as the large trunks terminating in the inferior cava. These all resemble each other in being contained in canals, and differ from the first class in not being contained in the lobules. As the intralobular veins terminate in some, and not in others, of the second class, these vessels may be divided into two sets,—those in which the intralobular branches terminate, and those in which no intralobular branches terminate. The lobules are arranged round the veins composing the first set, the bases of these bodies resting upon them. The branches of the second set are formed upon the first.

> "Each intralobular vein is composed of a central vessel, and from four to six or eight smaller vessels, which terminate in the central vessel. The intralobular veins invariably correspond in form with the lobules, the substance of which is arranged round them; and, as these vessels resemble in some degree the fibres of a leaf, so sections of the lobules made in the direction of the vessels, assume a more or less foliated appearance. The lobules are not, however, flattened bodies like leaves; for, as the smaller veins enter the central vein in every direction, so small processes project in every direction from the lobules, the number of processes being equal to the number of veins terminating in the central veins."

Mr Kiernan describes at greater length the lobules, the minute arrangement of the intralobular veins, and the difference between the superficial and the internal lobules. By superficial lobules, he means "not those only which form the convex and concave surfaces, but those also, the capsular surfaces of which form the canals containing certain branches of the hepatic duct, portal vein, and hepatic artery, and the canals containing the trunks of the hepatic veins, all these canals being tubular inflections inwards of the superficies of the liver." This portion of the essay is concluded with some observations on Mascagni and Muller's description of the lobules, for which we cannot afford space.

2dly, Of the Surfaces of the Liver.—The surfaces of the liver he examines under three heads,—*1st*, the external surface; *2dly*, the portal surfaces or canals at which the vessels enter the organ; and *3dly*, the hepatic venous surfaces. The first of these we shall pass over, as, though ably described, it is less interesting than the others.

Of the Portal Canals.—"These canals commence at the transverse fissure, where they are continuous with the concave surface of the liver. They contain the hepatic duct, the portal veins, the hepatic arteries, and the vaginal branches of all these vessels, with the nerves and absorbents enveloped in a sheath of cellular tissue, first described by Glisson, and called Glisson's capsule." The opinions of various authors regarding the structure and use of this capsule are briefly stated and discussed, and the conclusion drawn, that it "is not mere cellular tissue; it is to the liver what the *pia mater* is to the brain; it is a cellulo-vascular membrane in which the vessels divide and subdivide to an extreme degree of minuteness; which lines the portal canals, forming sheaths for the larger vessels contained within, and a web in which the smaller vessels ramify; which enters the interlobular fissures, and, with the vessels, forms the capsules of the lobules; which finally enters the lobules, and, with the blood-vessels, expands itself over the secreting biliary duct. Hence arises a natural division of the capsule into three portions,—a vaginal, an interlobular, and a lobular portion; and as the vessels ramify in the capsule, their branches admit of a similar division.

"At the transverse fissure the duct, vein, and artery divide into branches, which enter the portal canals. These branches divide and subdivide into smaller branches, which enter smaller canals, and every canal, however small, contains one principal branch of each of these vessels; frequently, however, two ducts and two arteries are contained in the same canal. To these larger vessels the terms of hepatic ducts, portal veins, and hepatic arteries may be confined, in order to distinguish them from the branches.

"The excreting ducts are composed of the hepatic ducts contained in the canals, of their vaginal branches also contained in the canals, and of the interlobular branches which, arising from the vaginal branches, ramify in the interlobular fissures. The interlobular ducts enter the lobules, in which they form plexuses. These plexuses may be called the lobular biliary, or secreting biliary plexuses, the ducts composing them being the secreting organs of the bile. The excreting ducts and their branches are invariably accompanied by the arteries and portal veins and their branches,—the former conveying blood to their coats, the latter conveying it from them; a duct is never unaccompanied by an artery and vein, the vein being always a branch of the portal vein. The veins and arteries also enter the lobules. The veins form plexuses, the branches of which terminate in the intralobular hepatic veins; from the blood circulating through the plexuses the bile is secreted. The lobular arteries are exceedingly minute, and few in number; they are the nutrient vessels of the lobules, and probably terminate in the plexuses formed by the portal vein. From the ducts, veins, and arteries, therefore, three sets of branches arise,—namely, the vaginal, the interlobular, and the lobular branches."

Of the Vaginal Portion of Glisson's Capsule and its Vessels.—A branch of each vessel contained in a portal canal issues from the canal on the surface of each of the interlobular spaces, which are numerous and close together. The hepatic duct and artery are in opposition, with a very limited number of spaces, but are connected with all the spaces by means of plexuses from which the interlobular branches arise. In like manner a plexus is formed by the portal vein. "The branches forming these plexuses are the first which arise from the duct, artery, and vein. They form a vascular sheath around these vessels, and may be called their vaginal branches. They ramify in a loose and fine cellular tissue, which with them constitutes the vaginal portion of Glisson's capsule." Mr Kiernan describes with great minuteness the disposition of the vaginal portion of Glisson's capsule, and concludes, that the capsule is a cellulo-vascular membrane, composed of the vaginal branches of the duct, vein, and artery, ramifying in a layer of cellular tissue. With the same minuteness he describes the distribution of the vaginal branches of the ducts. The following is his description of the ducts themselves:—"The coats of the ducts are highly vascular: the rugæ on their internal surface, and those on the internal surface of the gall-bladder, are formed by the ramifications of the larger blood-vessels, arteries, as well as veins, covered by the mucous membrane. This membrane is studded with vascular papillæ, which become remarkably developed in the diseased ducts so frequently found in sheep and oxen. The smaller ducts are furnished with papillæ only; and to the rupture of the delicate vessels forming these papillæ, is to be attributed the facility with which Soemmering and other anatomists injected the ducts from the arteries and veins, and not to any direct communication between the vessels and the ducts. * * * The coats of the ducts may be as highly injected from the portal veins as from the hepatic artery; but they cannot be injected from the hepatic veins if the injection is confined to these vessels, and does not return by the portal veins. * * * The ducts cannot be injected in a direct manner from the hepatic vein, no branches of this vein ramifying on their coats. Fluid may, indeed, be made to pass from this vein into the ducts, but only through the medium of those branches of the portal vein which ramify on the coats of the ducts. The ducts are injected from the portal vein and from the hepatic artery in the same manner as the fœtal intestine is frequently filled with injection from the umbilical vein or aorta, viz. by the rupture of the minute vessels of the mucous membrane. Hence it is evident, that the ducts, so far as they have been yet traced, are abundantly supplied with arterial blood; that this blood returns into the branches of the portal, and not into those of the hepatic veins; and that the hepatic portal vein has branches of origin in the coats of the excreting ducts from the terminations of the hepatic artery, as the abdominal portal vein arises in the coats of the intestines, in the spleen and pancreas, from the arteries of these organs.

"From their extreme vascularity alone, we might infer, that the ducts serve another purpose besides that of the conveying of the bile. All anatomists are acquainted with the muciparous follicles of the lining membrane of their larger branches. In the smaller branches, the existence of the follicles has been denied. In the former they are irregularly distributed over the surface,—in the latter they are closely arranged in two longitudinal lines occupying opposite sides of the ducts; and, arranged in this manner, they will be found in the smallest duct that can be examined. * * * Their number renders it probable that the fluid furnished by them serves another purpose besides that of lubricating the surfaces of the ducts. Some estimate of the quantity of this fluid may be formed by examining the ducts after having injected them with alcohol. These follicles are probably the secreting organs of all the mucus found in the bile."

Mr Kiernan proceeds to point out the distribution of the vaginal arteries and veins. The arteries accompany the ducts; they are more or less tortuous in their course, and anastomose freely with each other. Their ramifications do not correspond exactly to the fissures. The left artery communicates with the right by vaginal branches given off by the former in the fissure, and anastomosing with similar branches of the latter.

" The vaginal branches of the vein anastomose with each other," forming a much more complicated plexus in the human liver than in that of most animals.

The nerves and deep-seated absorbents ramify in the portal canals. Mr Kiernan has not been able to trace them into the interlobular fissures. " The absorbents may always be injected from the duct, and the bile is frequently propelled into the former vessels by injecting the latter." Mr Kiernan has frequently found, like Mascagni, that an injection thrown into the ducts returns colourless by the absorbents; but he has as frequently seen the injections in the absorbents of the same colour as that thrown into the duct, and has frequently filled all the absorbents of the right edge of the lesser omentum with red size from the duct. In the only instance in which the trial was made, the thoracic duct was injected with mercury from the hepatic duct. After mentioning that Panezza has refuted Lippi's opinion, that there is an infinite number of communications between veins and lymphatics in other parts of the body besides the thoracic duct and right subclavian vein, Mr Kiernan observes, that no absorbents accompany the hepatic veins, and that it is not probable that any of the absorbents of the liver terminate in the branches of the portal veins, the fluids in these two systems of vessels proceeding in different directions. The superficial absorbents ramify in the proper capsule. Injections sometimes pass from the arteries and portal veins into the absorbents.

Of the interlobular portion of Glisson's Capsule, and of its Vessels.—" As the interlobular ducts, veins, and arteries arise from the vaginal ducts, veins, and arteries, so the interlobular cellular tissue is continuous with the vaginal cellular tissue, the vessels, and cellular tissue, together constituting the interlobular portion of Glisson's capsule, which occupies the fissures, and forms the capsules of the lobes. The interlobular vessels, at their origin from the vaginal vessels, enter the spaces: in the spaces, therefore, we find the largest branches; these divide into smaller branches, which ramify in the fissures."

An injection of size or mercury will pass from the left hepatic duct to the right without extravasation and without passing into other vessels, and will be found in the interlobular and vaginal ducts, as well as in the trunks. This communication does not take place through the medium of the vaginal branches of the transverse fissure, " the injection being found in interlobular branches arising from the right duct." From this it appears that the right and left duct anastomose with each other through the medium of the interlobular ducts.

" The interlobular branches of the portal vein cover with their ramifications the whole external surfaces of the lobules, with the exception of the bases of these bodies, and of those extremities of the superficial lobules which appear on the surfaces of the liver." The freest communication takes place between these vessels through the medium of the interlobular branches; " for though the vaginal branches in the same canal anastomose freely with each other, yet those of one canal communicate with those of another through the medium of the intervening lobular branches alone. The interlobular veins also form communications between the lobular veins of a lobule and those of the contiguous lobules. Hence it appears, contrary to the assertions of Bichat and Mappes, that the freest anastomoses exist between all the branches of the portal vein, and that the interlobular branches form the medium of communication."

Though no anastomosis can be shown to exist between the interlobular arteries, yet Mr Kiernan concludes, from the vaginal arteries communicating freely with each other, from the ducts also communicating with each other, and from the arteries ramifying in the coats of the ducts, that the interlobular arteries anastomose.

The capsular arteries, which are small and most numerous in those subjects in which the capsule is most developed, emerge from the superficial lobular fissures, and ramify in the proper capsule, in the convex and concave surfaces of the liver and the ligaments. Where these arteries are numerous, they cover the surfaces of the liver with a beautiful plexus. Those of the right lobe anastomose with those of the left, " and both anastomose with branches of the phrenic internal mammary and suprarenal arteries; some, leaving the liver, ramify under the peritoneum, covering the right kidney; others pass along the *ligamentum teres* to the umbilicus, and anastomose with the epigastric arteries." The capsular veins are branches of the portal vein; these vessels communicate freely with branches of the phrenic veins. In some cases of atrophy of the liver, and in cases in which the circulation through the liver has been for some time obstructed, a collateral circulation is established by means of the communications which take place between the capsular branches of the hepatic artery and portal vein, and those of the phrenic artery and vein. "All the *vasa vasorum* of the liver are branches of the hepatic artery and portal vein * * * All the veins arising in the coats of the vessels, and terminating in the portal vein, constitute the hepatic origin of this vein. The trunks of the duct, vein, and artery in each canal terminate in interlobular branches. Vaginal vessels giving off interlobular vessels, ramify in the transverse fissure, in the fissure of the gall-bladder, and in that containing the obliterated umbilical vein and *ductus venosus;* these fissures, therefore, must be considered as portions of portal canals."

Of the Hepatic Veins, and of the Hepatic-Venous Canals.—The hepatic veins, contained in what the author calls the hepatic-venous canals, commence in the interior of the liver, and terminate at the fissure of the inferior cava. "Those containing the hepatic trunks are formed by the capsular surfaces of a limited number of lobules; those containing the sublobular hepatic veins are formed by the bases of all the lobules."

Mr Kiernan proceeds to show that the hepatic veins have no branches corresponding to the vaginal branches of the duct, portal vein, and artery, and that, as Glisson's capsule is composed of vaginal vessels, ramifying in cellular tissue, nothing similar is to be found around the hepatic veins which have no vaginal branches.

On the internal surface of the sublobular veins, numerous minute orifices are found, which are the mouths of the intralobular veins, all of which terminate immediately in these vessels. Each orifice corresponds to the base of a lobule, consequently the number of orifices is equal to the number of lobules forming the parietes of the canal in which the vein is contained. The base of every lobule is in contact with a sublobular vein, and the hepatic venous canals are formed by the bases of all the lobules of the liver. The parietes of the portal canals are also composed of lobules, but only of their capsular surfaces, and all the lobules do not enter into their formation. It is thus evident that the hepatic venous canals are more numerous than the latter.

The differences between the sublobular hepatic veins and the hepatic trunks are minutely described, and the formation of the hepatic venous canals thus explained. "The smallest of the canals and greater number of them are formed by the bases alone of lobules; the next in dimensions are formed by the capsular surfaces alone of these bodies. As the base of every lobule rests on a sublobular hepatic vein, it is evident that those lobules, the capsular surfaces of which enter into the formation of canals, are in contact with two hepatic veins." From reasoning and experiment, the author comes to the conclusion, that the sublobular veins anastomose with each other, and that their intralobular branches do not. As a conclusion to this section, we extract Mr Kiernan's comparison between the hepatic vein and the portal vein.

> "By contrasting the hepatic veins with the portal vein, we find that no two intralobular branches of the former anastomose with each other; that the interlobular branches of the latter form one continuous plexus throughout the whole liver; that the sublobular veins anastomose directly, and not through the medium of the intralobular branches: that the portal veins have no direct communication with each other, but anastomose by means of their interlobular branches; that the hepatic veins, like the other veins of the body, proceed in a direct course to their termination in the cava; that the portal vein, accompanied by an artery, resembles an artery in its ramifications; that the larger hepatic veins having longitudinal fibres in their coats, differ in structure from the portal vein, and that the blood contained in the liver after death is almost invariably found in the hepatic veins, the portal vein being usually empty."

From longitudinal fibres, similar to those found in the coat of the iliacs, inferior cava, and some superficial veins, being met with in the coat of the larger hepatic veins, which are so firmly connected to the substance of the liver as to admit of no motion, the author concludes that these fibres cannot be muscular.

Of the Structure of the Lobules.—"The lobules constitute the secreting portion of the liver. Examined with the microscope, a lobule is apparently composed of numerous minute bodies of a yellowish colour, (imparted to them by the bile they contain,) and of various forms, connected with each other by vessels. These minute bodies are the *acini* of Malpighi."

After briefly stating the opinions of Malpighi, Ruysch, Boerhaave, Ferrein, Mascagni, and Muller, and criticising a passage in Dr Hope's work on Morbid Anatomy, Mr Kiernan thus describes the constituents of a lobule. "Each lobule is composed of a plexus of biliary ducts, of a venous plexus formed by branches of the portal vein, of a branch of an hepatic vein, and of minute arteries; nerves and absorbents, it is to be presumed, also enter into the formation, but cannot be traced into them."

" The hepatic ducts, commonly so called, and their vaginal and interlobular branches, constitute the excreting portion of the biliary apparatus; they are also organs of mucous secretion, being furnished with mucous follicles; the secreting portion of the liver is also composed of ducts which form a plexus in each lobule. These plexuses may be called the lobular biliary, or secreting biliary plexuses." Mr Kiernan attributes the difficulty of injecting the ducts to their extreme minuteness, to their being filled with bile, and to the bile contained in the excreting ducts being propelled by the injection into the secreting ducts, from which it has no exit. He has succeeded, however, in injecting these ducts, by first tying the portal vein and hepatic artery, in a living animal a few hours after feeding it. The animal survives several hours, during which time the ducts will discharge the bile which they contain. After preparing a liver in this way, Mr Kiernan has succeeded in partially injecting the lobules from the hepatic duct. He has done the same, but with less success, in the human body. " Examined by the microscope, the injected interlobular ducts are seen dividing into branches, which, entering the lobubles, divide and subdivide into minute ducts," which anastomose with each other, and form a reticulated plexus. When an uninjected is contrasted with an injected lobule, it will be found that the *acini* of Malpighi of the former are identical with the injected lobular biliary plexus in the latter. The blood-vessels are easily distinguished from the ducts. The ducts forming the plexus appear by the microscope like cells; an appearance which probably induced Mascagni to consider the liver as an assemblage of minute cavities giving origin to the ducts. " The form of the lobules bears no relation to the arrangement of the ducts, the form of each lobule being always correspondent to the branches of the intralobular hepatic vein occupying the centre of the lobule. The coats of the lobular ducts, on which the blood-vessels next to be described ramify, constitute the proper secreting substance of the liver, as the coats of the central ducts of the kidney, and those of the *tubuli seminiferi,* constitute the secreting substance of their respective organs."

The left lateral ligament Mr Kiernan considers to be a rudimental liver in which the organ is presented in its simplest form. " From the edge of the liver connected to the ligament, numerous ducts emerge, which ramify between the two layers of peritoneum of which the ligament is composed. These ducts were discovered by Ferrein, but this anatomist did not ascertain their termination. * * * These ducts, the smallest of which are very tortuous in their course, divide, subdivide, and anastomose with each other." They are sometimes very numerous, in which cases two or three of them are of considerable size. " They sometimes extend only half way up the ligament, where they divide into branches, which, forming arches, return and descend towards the liver, anastomosing, or being continuous, with other ducts issuing from it. The spaces betwen the layer, or excreting ducts, are occupied by plexuses of minute or secreting ducts."

Mr Kiernan has not succeeded in injecting the ducts on the inferior surface of the diaphragm to their termination, but he supposes that, like those just described, " they form arches, the branches returning towards the ligament and being continuous, with others ascending from it. Branches of the portal and hepatic veins, with arteries and absorbents also, ramify in the ligament, which, including between its layers a plexus of secreting and excreting ducts, with blood-vessels ramifying within parietes, admirably displays the structure of the liver."

After alluding to other ducts, the author gives it as his opinion, that, as no branches of hepatic veins ramify in the coats of the gall-bladder, the absence of these vessels sufficiently proves the non-existence of ducts. " The cystic veins are branches of the abdominal portal, and not of the hepatic portal or umbilical vein; they are therefore efferent, and not afferent vessels, conveying blood from, and not to, the gall-bladder. It necessarily follows that biliary ducts ramifying on the parietes of this receptacle would receive the materials of this secretion from arterial blood—that of the cystic arteries." But Mr Kiernan affirms that if in any case ducts should be found in the gall-bladder, branches of both the portal and hepatic veins will be found also. The portal ducts however, " in such a case, will be branches of the hepatic portal vein, will convey blood from the coats of the excreting ducts, and to the coats of the secreting ducts, and not from the gall-bladder.

" Branches of the hepatic artery and portal vein accompany the *ligamentum teres*. These veins convey blood to the hepatic portal vein, and must therefore be considered as separate branches of the abdominal portal system."

Of the Lobular Venous Plexuses.—The interlobular branches of the portal vein divide into branches which enter and form a plexus in each of the lobules. This plexus constitutes the venous part of the lobule, and may be called the lobular venous plexus. Its branches terminate in the intralobular hepatic, situated in the centre of the lobule. By the aid of a powerful microscope, the vessels constituting the plexus are seen converging from their origin at the circumference towards their termination in the centre of the lobule, and communicating with each other by smaller transverse branches, between which are minute spaces occupied by portions of the lobular biliary plexus. " The venous plexus of one lobule communicates with the plexuses of the surrounding lobules, by means of the intervening lobular branches of the *vena portæ*, this vein forming one continuous plexus through the whole liver." The converging branches of each plexus unite at the centre of each lobule to form an intralobular hepatic vein, which has no communication with the corresponding veins of the contiguous lobules, except through the medium of the intervening plexus and portal veins. " No branches of the hepatic veins are found in any other part of the liver, occupying the centre alone of each lobule. Their only office is to convey the blood from the lobular venous plexuses, and not from the arteries."

" The venous plexus ramifies on the biliary plexus; the blood circulating through it is composed of the portal blood, and certainly if that portion of the arterial blood, which having nourished the excreting ducts, and supplied them with mucus, and having circulated with the *vasa vasorum* of all the vessels becomes venous and is received into the branches of the portal vein, by which, with the portal blood, it is conveyed to the plexus, and from this mixed blood, the bile is secreted."

Of the Lobular Arteries.—The lobules are sparingly supplied with arterial blood. From several experiments, Mr Kiernan concludes, that the secreting part of the liver is supplied with arterial blood for nutrition only. As all the branches of the artery, of which the termination can be ascertained, end in branches of the portal vein, " it is probable that the lobular arteries terminate in the lobular venous plexuses formed by that vein, and not in the intralobular branches of the hepatic veins, which cannot be injected from the artery, the blood of these arteries, after having nourished the lobules, becoming venous, and thus contributing to the secretion of the bile."

Of the red and yellow substances of Ferrein, and of the appearances produced in the liver by congestion.—Of these subjects Mr Kiernan states his opinion in these words. " The structure of all lobules is similar, and each lobule of the same structure throughout; one part of a lobule is not more vascular than another. There is, therefore, no distinction of red and yellow substance in the liver; the red colour results from congestion only." It would be impossible, with any justice to Mr Kiernan, to abridge that portion of his paper on which these views are defended. The opinions of different authors regarding the alleged existence of the red and yellow substance of the liver are briefly examined, and the sources of these errors pointed out.

We regret that we must pass over his able remarks on congestion of the liver. We can make room only for his conclusions, and for his remarks on Mr Abernethy's celebrated case.

" The physiological deductions arising out of the preceding anatomical facts are extremely simple. If it could be shown that two substances exist in the liver, it might be fairly presumed that this organ executes two functions; but each lobule being, in itself, a perfect gland, and of the same structure throughout each lobule, and consequently the whole liver executes but one function, the secretion of bile."

" It has been shown that all the *vasa vasorum* of the liver are branches of the hepatic artery and portal vein; that branches of the portal vein arise in the coats of the hepatic veins themselves; and that the veins of the coats of the vessels constitute the hepatic origin of the portal vein. The arterial blood having circulated through the coats of the vessels becomes venous, and is conveyed by the veins arising in the coats of those vessels into those branches of the portal vein which correspond to the vessels in the coats of which the veins arise; thus, from the coats of the vaginal ducts, veins, and arteries, they convey the blood into the vaginal veins; and from the coats of the interlobular ducts, veins, and arteries, into the interlobular veins. From the coats of hepatic veins and inferior cava, the blood is conveyed into the interlobular portal veins. In the vaginal and interlobular veins the blood conveyed from the coats of the vessels becomes mingled with the proper portal blood. This mixed blood is conveyed by the interlobular veins into the lobular venous plexus, in which the lobular arteries probably terminate, after having nourished the secreting ducts. From the mixed blood circulating through the plexus, the bile is secreted by the lobular or secreting biliary plexuses.

" The blood which enters the liver by the hepatic artery fulfils three functions; it nourishes the liver, it supplies the excreting ducts with mucus, and, having performed these purposes, it becomes venous, enters the branches of the portal vein, and contributes to the secretion of the bile. The portal vein fulfils two functions; it conveys the blood from the artery, and the mixed blood to the coats of the excreting ducts. It has been called the *vena arteriosa*, because it ramifies like an artery, and conveys blood for secretion; but it is an arterial vein in another sense, being a vein to the hepatic artery, and an artery to the hepatic vein. The hepatic veins convey the blood from the lobular venous plexuses into the *vena cava* inferior."

The following is Mr Kiernan's account of the appearances of the liver of the child mentioned by Mr Abernethy. After alluding to Mr Green's and Sir C. Bell's opinions, he thus proceeds.

" I examined the liver of this child, which had not been examined by Mr Abernethy, in the presence of Mr Stanley, Mr Mayo, and several other gentlemen, in the museum of St Bartholomew's hospital. Mr Abernethy had injected the arteries with red, and the hepatic veins with yellow, size. As had been happily conjectured by Mr Green and Sir Charles Bell, we found the open and uninjected ramifications of the umbilical vein (the hepatic portal vein) accompanying as usual the branches of the hepatic artery and duct. By making sections of portal canals, we found the arteries, as Mr Abernethy had described them, much larger than usual. In ordinary cases, one principal artery is found in each canal; in this case two, and in some places three, arteries of equal calibre were found in each canal. The branches of the umbilical or portal vein, which are usually so much larger than those of the artery, were found on the surfaces of sections of the liver, to be, as nearly as we could judge, equal in calibre to the united dimensions of the two or three arteries which accompanied each branch of the vein. * * * * * Bichat's opinion * * is completely refuted by the dissection of the liver in this case. The branches of the duct were much smaller than those of the artery; in one canal, in which there were three arteries of equal dimensions, the duct was of about half the size of one artery. This case, therefore, does not establish an analogy between the biliary organs of the vertebrated and invertebrated animals; but, on the contrary, it shows that the class of monstrosities to which it belongs forms a much slighter deviation from the ordinary vertebrated type than was imagined. Nor does it militate against the conclusions maintained in that paper upon the physiology of the liver, although, as Mr Mayo observed, it cannot be supposed that the arterial blood in its passage through the *vasa vasorum* into the branches of the umbilical vein underwent the usual change into venous blood; and it was still, he contended, arterial blood, though less pure in character, which was conveyed through venous canals into the secreting part of the liver."

We conclude this necessarily imperfect sketch of Mr Kiernan's views, by strongly recommending the reader to avail himself of the first opportunity to peruse the paper itself. We can assure him that it will bear more than one reading, or rather that one perusal will not do it justice.

Mr Kiernan has promised a paper on the morbid anatomy of this organ, and we trust that we shall soon see both papers printed in such a form as to bring them within the reach of every member of the profession.

ART. VIII.—*Outlines of Human Physiology.* By HERBERT MAYO, F. R. S., F. G. S., Professor of Anatomy in King's College, London; Surgeon to the Middlesex Hospital; formerly Professor of Anatomy and Surgery to the Royal College of Surgeons. The Third Edition. London, 1833. 8vo, pp. 478.

IN the twenty-ninth volume of this Journal is a short account of the first edition of this work, sufficiently minute, however, to convey an idea of its nature and merits as an elementary treatise. It will there be seen that we formed so favourable an opinion of the treatise of Mr Mayo, as to take some pains to suggest various amendments, the introduction of which, we presumed to think, would render it almost as complete as any elementary work upon a subject so rapidly advancing, and cultivated by so many hands, as physiology can possibly be. Since that period the work of Mr Mayo has passed through two editions; a tolerably unequivocal proof of the accuracy of the judgment which we then ventured to deliver; and if Mr Mayo has not adopted all our suggestions, he has at least adopted so many of them as to show that he is at once eager to improve his work by every rational hint, yet determined to weigh deliberately the justice of all, and to admit none, unless he is himself satisfied of the validity of their claims.

As an elementary treatise on physiology, indeed, we think that the present edition is every thing that could be wished as a guide to the student. Observing the same arrangement as in the first edition, Mr Mayo has given accurate and just views of the present state of facts and reasonings on the various functions of the human body; and, notwithstanding the narrow limits within which he was necessarily confined, he has entered as minutely into the detailed consideration of the controverted and uncertain parts of the science as the interest of the student requires. Throughout the whole work, the author has studied, by introducing all the most recent information, and estimating its accuracy with the utmost impartiality, to direct the attention of the reader to the points which may be regarded as ascertained, and in this manner to communicate a just and instructive idea of the present state of physiological science.

We observe, nevertheless, in the mode of treating several subjects, peculiarities, which, if not to be classed among omissions and errors, are at least defects, which we should, in performing the same task, have studied to supply. We shall not, like the critic on the Roman classic, collect the whole of them, and present them in alarming array to Mr Mayo; but we shall advert to them slightly as we pass along in noticing those parts of the treatise which we think require especial mention.

In the article already alluded to, we showed in what manner Mr Mayo had considered the doctrines on the function of circulation and those of the nervous system. On the present occasion, we must principally limit our observations to those subjects on which the author has changed or otherwise rectified some of his doctrines.

In treating of the blood in chapter second, the author adverts shortly to the observations of Dr Marshall on the capillary vessels in cold-blooded animals. Perhaps an account of the anatomical characters of the capillaries, as established by the observations of Dr M. Hall, might have formed a proper ingredient in the composition of a work on physiology.

We should have expected Mr Mayo to introduce in his history of the blood some account of the experiments made, and the conclusions deduced, by Dr Babington of London, M. Le-Canu, and M. Boudet. We perceive that he takes no notice either of the alleged *Liquor sanguinis* of the former author, or the *hematosine* of M. Le Canu, or the curious observations by M. Boudet, illustrating partly the existence of *liquor sanguinis*, partly that of the various secretions in the blood.

It is also rather remarkable, that, in speaking of opaque or milky-coloured serum, as noticed by Hewson, he does not give any explanation of the cause of this phenomenon, nor does he advert either to the experiments of Dr Traill or Dr Christison, which show that it depends on the presence of oil, which is suspended in it as an emulsion, and which may be readily separated by the addition of sulphuric ether.

In treating of the arteries, Mr Mayo appears to speak as if he were the first to show that relaxation of the arteries is the cause of local action. Without disputing about terms or their application, we must be permitted to remind Mr Mayo that this doctrine has been several times advocated by various physiologists since the time of Berlinghieri, and of late years by Wilson Philip, Hastings, and others, He will find also in various articles in this Journal the same doctrine repeatedly stated, and explained.

The seventh chapter, on the function of digestion, is improved by various changes and corrections. On the subject of the process of chylification, the author has introduced from the pages of this Journal some observations which we conceived it necessary to make on occasion of the appearance of the works of Tiedemann and Gmelin, and Leuret and Lassaigne. The view given by Mr Mayo of the various processes concerned in digestion is now as complete as the present state of accurate information admits.

In the eleventh chapter, on the functions of the nervous system, we recognize still more extensive changes and improvements. After an instructive introductory view of the mental phenomena in man and animals in the first section of the chapter, the author proceeds in the second to explain the history of the different parts of the nervous system, by giving a short sketch of the rudimental elements, or essential parts of that system as they are exhibited in the radiated animals, the articulated animals, the molluscous tribes, and lastly, the vertebrated animals. By ascending in this manner from those classes of living beings in which the anatomical structure of the nervous system is in its most simple form, to those classes of animals in which it presents the complex arrangement,—all illustrated by appropriate diagrammatic figures, the author is enabled to establish various important inferences, regarding the connection between the composition and parts of the nervous system, and the degree of vital action, and sensitive perception, and intellectual function exhibited by the respective classes. These we shall attempt to state shortly in the following manner, adopting as nearly as may be the order observed by the author.

1. The most essential part of the nervous system is a double chord of nervous matter, or, to speak more to the point, a longitudinal chord, consisting of two parallel portions united at both extremities, each corresponding with one-half of the body, and various ramified chords denominated nerves, extending between this central chord, and the sentient, contractile or secreting organs of the animal.

2. The construction of the nervous system in the higher animals is distinguished from that of those at the lowest end of the scale, by the presence of cerebral masses, superadded to the anterior or the cephalic end of the double chord. Animals of the higher class are also distinguished by a large share of mental endowments and especially of sensibility; and Mr Mayo consequently infers, that it may be probable that the superadded parts viz. the cerebral masses, are connected with the superadded functions; or in other terms, that while common sensation and instinct are connected with the double chord and ramified nervous threads, the functions of animal sensibility, voluntary contractility, and intellect depend on the presence of the cerebral masses.

Every one must here perceive the coincidence between the conclusions of Mr Mayo on the connection of the functions of instinct and common sensation, with certain parts of the nervous system, and those to which we have already directed the attention of the reader, as deduced and maintained by Bellingeri. If it be not regarded as an additional instance of coincidence, it must at least be admitted to be a proof of the general accuracy of the doctrine now maintained, that Mr Mayo adduces in proof of the justice of his conclusions, the same set of cases of defect of brain, to which M. Bellingeri refers, and also quotes the case observed by Mr Lawrence of the acephalous infant, in which the organic functions of respiration, circulation, secretion, and common sensation, as well as instinctive motion, were perfectly performed for four days, yet without brain or cranium.

3. It appears from experiments in which the brain is removed or destroyed in successive portions, as well as from such cases of interrupted developement or defective organization as that now referred to, that sensation, that is, common sensation, and instinct are dependent not on the brain, but on the *medulla-oblongata*, or spinal bulb,—embracing particularly the origins of the Fifth, Seventh, and Eighth pairs of Nerves. The only ap-

parent exception to this occurs in cold-blooded animals; and this becomes, if properly viewed, not an exception, but a confirmation. In warm-blooded animals, the vitality of the nervous system is so intimately connected with the circulation, that when the latter is interrupted, the due performance of the functions of the former is proportionally deranged. In cold-blooded animals, the *medulla-oblongata* may be divided in such a manner, viz. below the origin of the Fifth and Eighth Pairs, that the head retains its sensibility and consciousness, while the body is, physiologically speaking, dead; but conversely, if it be divided above the origin of the Fifth and Eighth Pairs of Nerves, the animal is blind, the head dead, and the body alive.

4. From all these and similar facts it may be inferred, that the faculties of the nervous system differ very widely in the vertebral, and in the invertebral animals. The language of Mr Mayo is on this subject not very clear or specific; and his reasoning is rather confused and difficult to follow. But, so far as we comprehend his meaning, it is, that, in vertebrated animals, the spinal chord consists of a series of segments, each of which possesses an independent principle of sensation and motion, or instinctive action, analogous to the same properties in the parallel chords of the invertebrated classes of animals, but that the cephalic extremity or spinal bulb in the former communicates further a principle of vitality, which implies the necessity of continuity with the double chord to the endurance of life.

After establishing these propositions as general principles, he proceeds to treat, in separate and successive order, of the functions peculiar to the spinal chord, to the *medulla oblongata* or spinal bulb, and to the brain, and eventually to the nerves.

It is unnecessary to enter into the examination of the manner in which Mr Mayo has treated these subjects, as that would involve considerable repetition; and we must confine ourselves chiefly to what is now most interesting or most questionable.

We perceive, in the *first* place, that Mr Mayo, in mentioning the method of exposition employed by M. Foville of Rouen, denies the conclusions deduced by that anatomist regarding the great commissure. He admits the sincerity and good faith of M. Foville in representing this to be a satisfactory method of demonstration; but he thinks that M. Foville is deceived by employing an imperfect method; and he maintains that the recent brain will not answer the purpose. There is no doubt of the fact, that it is perfectly possible to exhibit the white fibrous matter of the commissure, as M. Foville does; and we confess we do not perceive that the method of doing so in the recent brain is objectionable. It may be incomplete, and, without the evidence derived from exposition in the prepared or indurated brain, may be inadequate to uphold any positive inferences regarding the essential connection and communication of parts; but we do not perceive that it ought to be disregarded.

But whether this be admitted or not, it will avail little to the elucidation of the phenomena; and Mr Mayo has wisely relinquished, in the meantime, the evidence deduced from mere structure, to advert to that derived from experimental inquiry, and from observing the effect of diseases and accidental injuries on the several regions of the brain.

One of the most interesting and successfully reasoned parts of the discussion is that in which the author, after considering the influence of different portions of the brain upon the functions of sensation and voluntary motion, proceeds to estimate the relation between the composition, size, and structure of the brain to the intellectual endowments of the animal or class of animals.

"It does not appear," he observes, "that an increase in the absolute weight of the brain confers a superiority in mental endowments. Were this the case, the intellects of the whale and the elephant should exceed the rational nature of man. Neither does the relative weight of the brain to the whole body appear the measure of mental superiority. The weight of the human brain is but $\frac{1}{35}$ of the frame, while that of a Canary bird is $\frac{1}{14}$. Nor in conjunction with purity of form and structure ever does this relation appear of any value. The eagle is probably as sagacious as the Canary bird; but the weight of its brain is but $\frac{1}{260}$ of its entire weight."

"We may next inquire," he continues, "whether an increasing number and complication in the parts of the brain is essentially connected with improved mental functions. The first instances which occur to the mind are in favour of the affirmative of this supposition. It may be inferred from their docility and surprising capability of receiving instruction, that birds have higher mental endowments than fish; and, accordingly, in place of the nodules of the fishes' brain, which are scarcely more than tubercles to originate nerves, birds possess an ample *cerebrum* and *cerebellum*. But in pursuing this argument, if we compare, on the other hand, the brain of birds with those of alligators and tortoises, we find no striking difference in physical superiority in the former over the latter; yet in mental developement the tortoise and alligator are probably much nearer to fish than to birds. The *instantia crucis*, however, upon this question, is founded in the comparison of the brain of the Cetaceous Mammalia with the human brain on the one hand, and with that of fish on the opposite.

"The Cetaceous Mammalia have brains, which, besides being of large size, are nearly as complicated as those of human beings; they might therefore be expected, if the opinion which I am combating were true, to manifest a remarkable and distinguishing degree of sagacity. Endowed with a brain approaching nearly in complexity and relative size to that of man, the dolphin should resemble in his habits one of the transformed personages in eastern fable who continue to betray, under a brute disguise, their human endowments. Something there should be very marked in his deportment which should stamp his essential diversity from the fishes in whose general mould he is cast. His habits, too, not shunning human society, render him especially open to observation; and the class of men who have the constant opportunity of watching his gambols in the deep are famed for their credulity, and delight to believe in the mermaid, the sea-snake, and craken. Yet the mariner sees nothing in the porpoise or the dolphin but a fish, nor distinguishes him, except by his unwieldy bulk, from the shoal of herrings he pursues. The dolphin shows, in truth, no sagacity or instinct above the carp, or the trout, or the salmon. It is probable even that the latter, which have but the poorest rudiment of a brain, greatly exceed him in cunning and sagacity."—Pp. 249, 250.

After some further observations on the comparative size and complication of the brains of various other animals, as the *ornithorhyncus*, the monkey, the dog, &c. Mr Mayo arrives at the conclusion, that our present facts do not afford evidence of any essential superiority in the brain of man over that of animals, or of the existence of any peculiar physical condition fitting the human brain to co-operate with a rational soul.

In the fifth section of this chapter, devoted to the Physiology of the Nerves, in which the author enters on a sketch of the properties recently ascribed by Sir Charles Bell and himself to the fifth and seventh pairs of cerebral nerves, we do not find much difference of statement from what was given in the former edition of the work. But we feel it requisite to offer on this point a few observations.

It may be observed, in reference to this subject, that in several of the recent numbers of the Medical Gazette, 31st and 34th, Mr Alexander Shaw has studied to give what he conceives a just view of the doctrines of Sir Charles Bell, with the purpose of rectifying the alleged mistaken notions adopted by many, and, among others, not only by Mr Mayo, but by Mr John Walker of Manchester, as he represents, on these opinions, and also in order to secure to Sir Charles Bell his just title to discovery in this department of physiological inquiry. It appears to us that the controversy which has been thus revived, may be satisfactorily determined, without giving any one of the gentlemen who have been engaged in the investigation, any advantage over the other, or detracting in any degree from his merits; since every one of them is equally anticipated by Bellingeri, and since the whole of the doctrines regarding the distinctive functions of the Fifth and Seventh pairs of nerves have been much more clearly and fully laid down by that author in 1818 than by any of those by whom the subject has since been studied.

We have already, in our account of the Dissertation of Bellingeri, shown how completely he has anticipated, both by anatomical and physiological, and also by pathological arguments, the doctrines maintained by Sir Charles Bell on the distinctive faculties of these two nerves; that he had successfully shown that the larger plexiform portion of the Fifth Pair ministers to sensation, instinctive action, and other organic functions, while the smaller is equally the nerve of the voluntary actions of the temporal, masseter, buccinator, and pterygoid muscles; and that he has shown that the Seventh Pair is properly the converse of this nerve, in so far as it consists also of two portions, a larger and a smaller,—the former of which is expended on the voluntary muscles of the head and face, while the latter ministers to the motions of certain parts, muscular and others, which are not under the influence of the will. In showing all this, it results, that M. Bellingeri has anticipated not only Sir Charles Bell, but the present author, and every one who has trodden the same path; and we confess we are somewhat surprised, now that our attention is again directed to the statement of these doctrines as given by Mr Mayo, and the claims urged by that gentleman, at the close coincidence between them and those of Bellingeri; and that, nevertheless, no mention is made of him, or of his researches and doctrines.

This will require some little explanatory statement.

Mr Mayo, after quoting with some observations the two experiments formerly mentioned as performed by Sir Charles, in one of which the *portio dura* was divided on one side, and in the other the superior maxillary branch of the fifth pair was exposed, irritated, and then divided,—adduces two of his own counter-experiments, in the first of which the *portio dura* was divided on both sides, and in the second, the second and third division of the fifth pair were divided at the part of emergence,—deduces from these experiments the following conclusions.

> " No doubt, I believe, is now entertained, that the inference which I drew from these experiments is correct; namely, that the *portio dura* of the seventh nerve is a simple voluntary nerve, and that the *facial branches* of the fifth are exclusively sentient nerves. The only circumstance which seemed to throw a doubt upon these conclusions was the uselessness of the lips to the animal in gathering food, after the fifth alone had been divided. If the facial branches of the fifth be not, as Sir Charles Bell supposed, nerves of motion as well as of sensation, how happens it that muscles which they supply cease to be of use on their division?
>
> " This seeming difficulty I discovered to be entirely removed

upon referring to the history of cases of *anæsthesia.* In this disease the sensation of the extremities is wholly lost, while their muscular power remains. Now, it is remarkable that, in persons thus affected, the muscles of the insensible part can only be excited efficiently when another nerve is employed to guide them, and supply the place of that which has been lost."

Now, upon this point, let us see what Bellingeri says.

"We have undertaken hitherto to demonstrate that the fifth pair presides over involuntary actions; that is to say, the pathetic and sympathetic affections of the parts of organic life. But it is also distributed to manifold parts endowed with motion, viz. to all the muscles of the face, to the muscles of the palate, and upper region of the *pharynx*, to the muscles of the tongue and lower jaw, to some of the muscles of the head, of the nose, and of the ears; and lastly, to the *iris* and muscles of the internal ear. We must, therefore, inquire upon what principle it ministers to the motion of these parts."—P. 148.

He then shows, after a long, patient, and minute inquiry, that, while physiologists distinguish motions into voluntary, involuntary, and mixed, the motions to which the branches of the fifth pair are subservient, are those of the involuntary class, and that, if in any parts or organs whatever to which it is distributed, there are indications of animal sensation or motion, these depend on the presence of superadded nerves, generally from the seventh. He then concludes the whole in the following remarkable words.

"Statuam igitur, quintum par nervum esse sentientem et motorium vitæ organicæ in capite. Quæ de quinto pari generatim diximus, de ipsius *portione majori* tantum intelligenda."—P. 175. xxxvii.

From this it appears, as already stated in the article on this author's dissertation, that he regards the Fifth Pair as a nerve which regulates all those actions, whether sensitive or motive, which are independent of the will.

But if the coincidence be remarkable in reference to the large portion of the Fifth Pair, it is not less so as to the small or motific portion. On the anatomical distribution of this nerve and its veins, Mr Mayo makes the following statement.

"In pursuing this subject, I was led to observe, that there were muscles which received no branches from any nerve but the fifth; these muscles are the masseter, the temporal, and the two pterygoids, and the *circumflexus palati.* These muscles, again, I remarked, are supplied from the third division of the fifth, that is to say, from the particular division of the fifth with which the *smaller fasciculus* or root of the nerve is associated. After some careful dissection, in the greater part of which I afterwards found that I had been anticipated by Palletta, I made out that the smaller fasciculus of the fifth is entirely consumed upon the supply of the muscles I have named; to which it is to be borne in mind that twigs from the ganglionic portion of the nerve are likewise distributed."

"But I had already ascertained by experiment, that almost all the branches of the larger or ganglionic portion of the fifth were nerves of sensation. I proved this point by experiments upon the ass, the dog, and the rabbit, respecting the second and third division of the fifth; in the pigeon respecting the first division of the fifth. It was therefore thoroughly improbable that the twigs sent from the same part of the nerve to the muscles of the lower jaw should have a different quality, and be nerves of motion. For this function it was reasonable to look to the other nervous fibrils, which the masseter, and temporal, and pterygoid muscle receive; in other words, *to the branches of the smaller fasciculus*, or to the ganglionless portion of the fifth."

Now, in the whole of this train of reasoning, not only is Mr Mayo completely anticipated by M. Bellingeri in 1818; but the latter author, aware of the anatomical fact, that the voluntary muscles subservient to mastication, receive twigs also from the ganglionic or plexiform portion, had even advanced a step farther in connecting that anatomical fact with the physiological purposes which he represented it to perform. To place this in the clearest light, we shall adduce a few short extracts from the dissertation of Bellingeri.

We have already shown in the account of this dissertation, that the author had given a minute description of the distribution of the branches of the smaller portion, and that he had shown that these branches are confined to the temporal muscle, the masseter, the buccinator, the internal pterygoids, and one or two minute muscles of the chin. In his account of their physiological uses he begins in the following manner as a sort of general recapitulation.

"Portio minor quinti paris diversam omnino originem, iter, et structuram habet a majori ipsius portione, et per proprios surculos in musculum temporalem, massetericum, buccinatorium, pterygoideum externum et internum, orbicularem insuper labiorum, elevatorem anguli oris, et triangularem menti inseritur. Hanc minorem portionem dixit Palletta voluntarios exequi motus, et sympathice vel idiopathice trismo affici." Upon this point however, of its performing only voluntary motions, he expresses his doubt, and infers, that part of it is concerned in instinctive, or involuntary, or at least unconscious motions. He then states a little after the following general inference. "Spectat igitur portio minor ad nervos vitæ animalis, et quidem ad nervos motorios; nullibi enim sensibus præest et habita ratione ipsius officii *Nervus Masticatorius* esset dicendus;" and soon after adds the following modifying or exceptive observation.

"Verum demonstrato, prout sategimus, minorem hanc portionem per se voluntarios exequi motus, inquirendum remanet, cur in quibusdam circumstantiis *involuntarie* vel *ab instinctu* moveat musculos in quibus inseritur." Then follows the very explanation given in the above extract by Mr Mayo. "Hoc pariter anatomes explicatur adjumento; vidimus porro in præcedenti dissertatione minorem quinti portionem in suo e foramine ovato egressu, intime utplurimum per plexum ganglioformem cum maxillari inferiori connecti, insuper et fere omnes ramos portionis minoris accipere radices aut filamenta a ramis maxillaris inferioris; igitur portio minor in propriis ramificationibus est nervus compositus ex propriis filamentis et a filamentis maxillaris inferioris. Nil mirum inde, si voluntarios utplurimum et modo etiam involuntarios exequatur motus, quos tamen producit non *per propria filamenta, sed per ea quae a maxillari inferiori proveniunt, quem organicae vitae præesse, et involutarios perficere motus ex superius dictis constare dijudico*."—P. 178.

To us it appears that this extract makes it as clear and indisputable a point as ever was, that Bellingeri has here anticipated most exactly every deduction established by Mr Mayo, and has the merit of first demonstrating the fact, that the small portion of the Fifth Pair is a nerve subservient to voluntary motion, yet, by receiving twigs from the inferior maxillary of the larger portions, becomes capable of regulating the involuntary motions. The following explanation, therefore, by that gentleman becomes almost unnecessary.

> "By the experiments and reasonings which I have described, I thus established that the ganglionless portion of the fifth, and the hard portion of the seventh nerve, are voluntary nerves to parts which receive sentient nerves from the larger or ganglionic portion of the fifth. This happened before Magendie's discovery of the parallel functions of the double roots of the spinal nerves; and without wishing to assert the least claim to that discovery, I will yet observe, that I was led by the well known anatomical analogy between the fifth and spinal nerves to conjecture what M. Magendie proved, and was indeed actually engaged in experiments to determine the point when M. Magendie's were published. I say nearly, in as much as subsequently to the publication of my experiments upon the facial branches of the fifth and seventh, I had been misled by the analogy of the third, fourth, and sixth nerves to adopt an opinion respecting muscular sensation, which I did not correct till after I had seen M. Magendie repeat his experiments on the spiral nerves in this country."

It is unnecessary, after this lengthened and minute disquisition on the question of originality as to the functions ascribed to the Fifth Pair, to go over the same ground as to those represented to belong to the Seventh. On that point we must be satisfied by a general reference to what has been already stated in our account of the doctrines of Bellingeri. We cannot quit the subject, however, without saying that, even in the anatomical details of the necessary parts, Bellingeri appears to our mind to greater advantage than even the present author.

Mr Mayo, in his anatomical description of the Fifth Pair and their origin, though accurate enough, takes no notice of the still more just representation of that nerve by Malacarne and afterwards by Bellingeri. The representation of Hirsch, that the peculiar semilunar swelling is a ganglion, to which, in the height of his gratitude, he applied the name of his instructor Gasser, was shown by Meckel, Moscati, and Malacarne, to be unfounded and erroneous; and while these anatomists contended that the flat semilunar segment was a plexus, and not a ganglion, Soemmering, from careful personal dissection conceived that the nerve, or rather its larger portion, for of this distinction Soemmering was well aware, formed with the *dura mater* and blood-vessels a species of reddish knot or *nodus*, which manifested a habit intermediate between a ganglion and plexus, and that in this unravelling it was augmented to six times its natural size.* This view of the nature and composition of the semilunar enlargement receives still further confirmation from the testimony of Bichat, who remarks that while it does not present the dense pulpy tissue of ganglions, it exhibits the areolar spaces and interwoven fibres which approximate it to the characters of a plexus. † For these several reasons, it is impossible to doubt that Bellingeri is right in regarding this enlargement as rather a plexus than a ganglion, or, at all events, much nearer the former than the latter variety of structure.

After these facts, we confess it astonishes us, that British anatomists, and among the rest the present author, should continue to apply to this swelling the denomination of *Ganglion*. It may, indeed, be matter of mere opinion whether it is to be regarded as a ganglion or not, and referable entirely to the ideas which different persons attach to the term *Ganglion*; but we must say that it would be desirable upon this point to employ some general and understood character.

The semicircular swelling, indeed, which it forms on the petrous portion of the temporal bone, is so distinct from the nervous threads which are enclosed in it, and consists of such firm matter, that Malacarne with great justice applied to the outer ring the epithet of bracelet (*armilla*;) and we confess that the arrangement so designated does not, to our ideas, suggest a very just example of a ganglion. But whether ganglion or plexus, it must be admitted to be a peculiar mode of arrangement of the constituent fibrils of the nerve, previous to its ultimate division into these branches. It is also a singular circumstance, that the dividing branches after emergence from the ganglion or plexus are really larger than the whole mass of filaments previous to their entrance into that body.

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* De Fabrica Corporis Humani, Tome ii. p. 213.

† Traité d'Anatomie Descriptive, Tome iii. p. 161.

In making the foregoing observations on the priority of the distinction introduced by Bellingeri, we have no intention to underrate the merits of Mr Mayo. The chapter of which we have now concluded the examination exhibits, we have no hesitation in saying, the most just and complete view of the functions of the nervous system extant in the English language; and as such we recommend it to the attentive perusal of the student of physiology. That in some of the most important and curious principles therein unfolded Mr Mayo has been anticipated by Bellingeri, is no fault of his; since he might, by adopting the doctrines of that ingenious person, have saved himself much trouble and laborious inquiry. The proper light of viewing the whole history of the coincidence in this piece of physiological research, is to regard it as an additional and almost irrefragable proof of the general accuracy of the statements and deductions, that three different individuals, and we may add a fourth, have arrived by different routes at the same results; and, that though at variance upon certain minute points, all concur in the great general conclusions. The views given by Mr Mayo are almost complete as pieces of physiological instruction. They are deficient only so far as the history of the progress of discovery is concerned.

We must now, however, hasten over the rest of the volume.

In the fourteenth chapter we find the second section, which is devoted to the subject of voice and the mechanism of speech, enlarged and improved by various additions and rectifications. The author gives a very correct view of the motions, extrinsic and intrinsic, of the larynx, and of the changes which the glottis undergoes in the formation and utterance of sounds. Most of our readers are aware that he availed himself with great diligence and success of an accidental mode of studying their motions in one person who had been brought to the Middlesex hospital, after cuting through the larynx immediately above the vocal ligaments in attempted suicide, and in another who had cut the pharynx immediately above the thyroid cartilage. In the first case it was observed that in the attempt to vocalize, the vocal ligaments were brought nearly parallel, and the *rima glottidis* became a mere linear chink; and in the second case, the larger *cornua* of the larynx were observed to approximate mutually, and the arytenoid cartilages were observed to be brought into visible contact.

The fifteenth chapter, on the subject of generation, is probably the most finished and perfect in the volume; and we are at least certain that it is the fullest, the most accurate, and the most rational exposition of the nature of that process yet given in any elementary treatise. The author has been at great pains to select from every respectable and creditable source the facts best calculated to illustrate the most obscure and least known parts of the process of reproduction, and he has been proportionally successful in presenting an instructive view of the subject.

After a good preliminary account of the organs in both sexes, and of menstruation, he gives a very excellent description of the Graaffian or ovarian vesicle, and the seminal germs from Baer, with an account of the changes which they undergo in consequence of impregnation. Then follows a minute and accurate account of the developement of the embryon, according to the facts ascertained by Wolff, Pander, Meckel, Oken, Blumenbach, Cuvier, Baer, Rathke, Burdach, Dutrochet, Serres, Rolando, Prevost and Dumas, Dr Allen Thomson, and Velpeau, a history of the progressive growth and formation of the different textures and organs of the fœtus, and an account of the anatomical peculiarities of the fœtus,—all treated very ably in the second section. In the third section, which is devoted to the question of the source of nourishment of the fœtus, and its connection with the womb, Mr Mayo treats of the *deciduæ*, the placenta, digestion and nutrition of the fœtus, parturition, and the *mammæ*, and their secretion.

The sixteenth chapter is devoted to the interesting subject of the growth and the reparation of parts; and Mr Mayo considers attentively the faculties which the different elementary tissues possess of repairing injuries and breaches of various kinds.

In the seventeenth and concluding chapter, which is devoted to the varieties of the human species, the author gives from Blumenbach, Cuvier, and Prichard, an interesting account of the anatomical, physiological, and zoological characters proper to each. It is some objection, however, to this sketch, that while the author has followed the distinctions of Dr Prichard so closely, he has not stated the most important conclusions at which that physiologist has arrived.

Into the details of these several subjects it is impossible, within the limits of a notice like the present, to enter at any length. Nor is such an undertaking requisite. The information contained in the present volume is at the same time so complete, so much condensed, and so clearly arranged, that we conceive it ought to be in the hands of every student of physiology, and every one who wishes to obtain a just view of the structure of the human frame, the uses of its various organs, and the nature of animal bodies generally. It is unnecessary, however, to say more either in the way of character or panegyric. We have already sufficiently evinced our favourable opinion of this work, by the minuteness and length with which we have considered its contents.

Art. IX.—*The Physiology, Pathology, and Treatment of Asphyxia; including Suspended Animation in New-born Children—and from Drowning—Hanging—Wounds of the Chest—Mechanical Obstructions of the Air-passages—Respiration of Gases—Death from Cold, &c. &c.* By James Phillips Kay, M. D. formerly President of the Royal Medical Society, Edinburgh. London, 1834. 8vo, pp. 344.

In the twenty-ninth volume of this Journal, Dr Kay published an Essay containing a series of Observations and Experiments on the cessation of Contractility in the Heart and Muscles in Warm-blooded Animals, in which he arrived at the conclusion, that the phenomena of *asphyxia* or suspended animation were not occasioned, as was maintained by Bichat and his followers, by dark-coloured blood being distributed to the different organs, and extinguishing their contractile powers and other vital properties, but were produced by the circulation being stopped or arrested in consequence of interruption of the function of respiration.

In the present volume, the author has expanded, illustrated, and enforced this doctrine by some additional proofs and illustrations, and has applied it to explain the phenomena of *asphyxia*, from whatever cause that accident results, and to unfold what he conceives to be the most efficient and least injurious method of attempting to restore persons who have become its victims.

The circumstance now mentioned renders it quite unnecessary to enter into a formal review of the doctrines of the author, or the arguments by which he upholds them in the various sections of his work. But we believe that it is expected that we should inquire to what extent the truth of these doctrines is supported by the experiments, and how far they afford an adequate explanation of the phenomena of *asphyxia*.

It is generally allowed that the theory of *asphyxia* taught by Goodwyn, and modified by Bichat, is, upon the whole, so complete that its truth was admitted among physiologists, and acted upon by many physicians and surgeons. Though it was excellent, however, compared with the mechanical and fanciful hypotheses of the older physicians, it was evidently not faultless. That it did not, indeed, embrace all the facts of the case, was long felt by many, though it was not easy to specify the exact points in which it was deficient. In 1823, however, Dr Williams of Liverpool, in the course of some experiments made upon the chest and lungs, with the intention of ascertaining the merit of a theory and practical proposal of Dr Carson, saw strong reason not only to question the justice of the theory of Bichat, but to substitute in its place another, the soundness of which he conceived was almost unequivocally evinced by the phenomena of interrupted respiration, in whatever mode effected.

Dr Williams published the results of his observations and reasonings in a paper *on the Causes and Effects of an Obstruction of Blood in the Lungs*, inserted in the 19th volume of this Journal. Though this will render it unnecessary to do more than merely refer our readers to that paper, we shall recapitulate shortly, for the sake of those who may not have the volume at hand, the leading circumstances of the theory proposed by Dr Williams, more especially as they do not appear to have received from Dr Kay the attention to which they were entitled.

From several experiments performed with the view of ascertaining the state of the blood as to motion or rest in *asphyxia*, Dr Williams drew the following conclusions.

1. The passage of the blood through the lungs is obstructed on the suspension of respiration, while its circulation through the other parts of the body is continued.

2. The obstruction to the passage of blood through the lungs on the suspension of respiration is not the effect of a mechanical cause, that is to say, of any obstacle or impediment, we presume, within the vessels.

3. This obstruction of the motion of the blood in the lungs, on the suspension of respiration, arises from the deprivation of pure atmospheric air.

4. The blood found after death in the left auricle and ventricle is the remnant after the last contraction, and the subsequent draining of the pulmonary veins.

5. The obstruction or interruption to the motion of the blood through the lungs is one of the principal causes of the emptiness of the arteries after death.

And 6. The immediate cause of the cessation of the action of the heart is a privation of its natural stimulus, arising from the interruption of the movement of the blood through the lungs.

We have here enumerated the essential propositions of the theory of Dr Williams without comment or explanation; and shall merely remark, that he has illustrated and enforced the whole of them in a series of very distinct and conclusive observations, and that we thought he demonstrated satisfactorily the leading and essential principle of his inquiry, viz. that in suspended respiration or suspended animation, the motion of the blood in the lungs, that is, through the pulmonary artery, is at first retarded, and then stopped, until all marks of vital action cease to be recognized.

If it be singular that this important modification of the pathology of *asphyxia* attracted so little notice as it has done, it must appear extraordinary that the author of the present treatise, who has made the subject and the writers on it his particular study, should have given it no attention, until pointed out to him by the author, and even then he allows that he is anticipated in one only of the conclusions at which he has arrived. It is perhaps of no great moment whether Dr Kay be anticipated in one or in several of his conclusions. But we think it must be admitted by every impartial judge, that, if the anticipation has taken place in one only, that one is the most fundamental and important of all, and must assign to Dr Williams whatever merit is attached in the way of originality.

Dr Kay conceives that the experimental inquiries detailed in the paper alluded to in this Journal, and republished in the third chapter of the present work, entitle him to draw three leading conclusions regarding the nature of *asphyxia*. The first is, that the circulation is arrested after respiration ceases, because from the exclusion of oxygen and the consequent non-arterialization of the blood, the minute pulmonary vessels which usually convey arterial blood are incapable of conveying venous blood, which then stagnates in the lungs. The second is, that the arrest or stoppage of the circulation is sudden when the lungs are entirely deprived of air, and that blood ceases to flow from them into the left cavities of the heart, even in the smallest quantities, in about three minutes and a half. The third is, that, even supposing a great quantity of venous blood were transmitted through the lungs, and permeated the heart and muscles, it does not impair their contractility, but that, on the contrary, it is even capable of maintaining this property for a certain period. He infers, indeed, from his experiments, that venous blood does not possess any noxious quality, by which the organic functions of these tissues can be destroyed, but is simply a less nutritious and stimulating fluid than arterial blood. The functions of muscular organs, in short, he argues, cease in *asphyxia*, because the circulation, and consequently the necessary supply of vital fluid, is arrested in the lungs.

It is quite clear that, according to this representation of the doctrine of Dr Kay on the nature of *asphyxia*, making allowance for the mere difference of terms, there is no essential difference between it and that taught some years before by Dr Williams; and it appears to us, that, if there be any merit in being the first to propose this modification on the pathology of *asphyxia*, that merit pertains to Dr Williams. There seems no reason, nevertheless, to imagine that Dr Kay had borrowed any part of his doctrine from those of Dr Williams; for he appears to have been entirely unaware of the existence of the essay of that gentleman; and perhaps this circumstance is to be regarded as one of those examples of coincidence which occasionally happen, and which may happen to different individuals engaged in the investigation of the same department of science.

In one circumstance only do the representations of the two authors differ. Both agree in representing the motion of the blood through the lungs to be stopped; but while Dr Williams maintains that the blood circulates through the rest of the body, if we understand him aright, Dr Kay infers that its circulation is there also retarded, and in no long time arrested; so that the successive motion of blood which is requisite for the brain exercising its influence over the organs of sensation and motion, for the muscles acting with energy, and the glands secreting, can no longer have place. To this part of the question we shall afterwards revert. But, in the meantime, it must be allowed, that, while it seems natural to think, that the pulmonary circulation being suspended, that of the system cannot well be continued for want of the usual supply, yet a small degree of circulation seems to proceed in the capillary vessels; and this, perhaps, is what favours the occurrence of recovery of cases of *asphyxia*, especially by submersion.

This point, however, being determined, it remains to be inquired, how far the representation given by the two authors accord with the facts, and to what extent their inferences are directly deduced from the experiments.

According to Dr Williams, the pulmonary circulation is interrupted, not in consequence of any mechanical impediment, as the subsidence or collapse of the lungs, but solely by the abstraction or deprivation of pure atmospheric air. According to Dr Kay, the circulation is arrested after respiration ceases, because, in consequence of the exclusion of oxygen, and the consequent non-arterialization of the blood, the minute pulmonary vessels, which naturally convey arterial blood, are filled with venous blood, which they are unable to convey, and which, therefore, according to him, must stagnate, or cease to move through the lungs.

In support of the accuracy of his views, Dr Williams appeals to the authority of Dr Thomas Thomson, Professor of Chemistry in the University of Glasgow, and Dr John Mason Good, from the last of whom he quotes a passage more remarkable for the studied effect of expression, than for the exact statement of a matter of fact. The proposition of Dr Kay rests on the general force of his experiments, with the assumption that the presence of oxygen is the essential condition to the chemical phenomena of respiration.

Let us consider the matter attentively, however, and see whether these statements be confirmed by facts and reasoning thereon.

If, as Dr Williams imagines, the cause of the cessation of respiration and the pulmonary circulation were the mere circumstance of being deprived of atmospheric air, then it might be expected that the mere constant supply of good atmospheric air, or the retention of that in the windpipe, and applied to the bronchial surface, ought to prevent the occurrence of *asphyxia*. But the supply of atmospheric air is of no avail, unless it be alternately inhaled and exhaled, in other words, unless the motions of the chest be continued to allow its alternate admission and expulsion. If the lungs be distended with the purest atmospheric air, and kept distended, that is to say, are prevented from collapsing and expelling the air, then *asphyxia* ensues as readily as under the vacuum of the air-pump.

If the representation of Dr Kay were altogether well-founded, then the mere continued supply of oxygen ought to be efficient in preventing the occurrence of *asphyxia*. Even this agent, however, which has been styled the *supporter of life and combustion*, is not alone, or in its pure state, adequate to maintain respiration; and it proves speedily as effectual a means of *asphyxia* as any of the other pure gaseous bodies. It is, in short, not the mere privation of respirable air that induces the interruption to respiration, but it is the occurrence of any circumstance which prevents the alternate admission of air to the lungs, and the exit of that fluid. This circumstance, which we conceive has been too much overlooked in all the theories on the nature of *asphyxia*, is connected with the fact, that it is requisite not only to supply something to the lungs, in order to maintain the pulmonary circulation, but to withdraw something from them; and whether this something be carbon, as is maintained by some, or carbonic acid, as is alleged by others, is of little moment to the determination of the question.

From all these facts and considerations, in short, we would infer that the alleged interruption to the motion of the blood in the lungs, or, as we say, through the branches of the pulmonary artery, depends not only on the supply of good pure atmospheric air adequate to aërate or oxygenate the blood of that artery, but on the alternate motions of the chest in expiration and inspiration, on the rising and expansion of the lung during the latter act, and on its subsidence and collapse during the former. To illustrate the position, that this retarded and finally interrupted motion is very greatly under the influence of these motions, we beg to ask, is it not the fact, that in experiments on animals the blood moves through the pulmonary artery more readily during inspiration than at the beginning and end of that act,—that it moves slowly, and may be retarded by stopping inspiration at its full extent, and that it may be interrupted altogether by interrupting the mechanical motions of the chest? What, also, we beg to ask, is the effect of rendering the chest incapable of moving, and the lungs of alternate expansion and collapse? Is it not, whatever be the means by which this is accomplished, *asphyxia* taking place, more or less suddenly, according to the degree in which these lesions are effected? Conversely, what is the effect of rendering the blood of the pulmonary artery incapable of moving into the veins? Is it not also *asphyxia*, more or less sudden, according to circumstances. It would be easy to show, in short, did our limits permit, that any cause which prevents the lungs from performing the alternate motions of inspiration and expiration, produces *asphyxia*, by interrupting the motion of blood in the pulmonary artery and veins.

The next point to be determined is, in what manner does this interruption in the motion of the pulmonary blood, or arrest of the pulmonary circulation, as Dr Kay terms it, operate on the other organs? It was one of the great objects of the inquiry of Bichat, to prove that the Modena blood of *asphyxia* was unable to maintain the life of the heart and brain, and other organs, and that, these organs being thus poisoned by an unfit and deleterious species of blood, death necessarily ensued.

Now it is perfectly possible that this theory may be correct; but the experiments on which its ingenious author established it, are neither conclusive nor free from objection. Aware of this frail point in the theory of Bichat, Dr Kay examines in his fourth chapter the question now proposed, and adduces several experiments, performed so as to obviate the objection now alluded to, in order to ascertain the true relation of the question. He injected venous blood gently, as he imagined, and after previous arterial depletion, into the carotid artery of rabbits, apparently without much immediate injury to the cerebral functions, and certainly without suddenly suspending these functions. From these experiments he infers, that the fatal effect observed in the experiments of Bichat, is the result of the force used in injecting venous blood, and that, as the symptoms of disturbance of the cerebral faculties ensue only, when the supply of blood circulating towards the brain, is diminished by the diminution of that arriving from the pulmonary veins, all these phenomena are to be attributed to arrest of the motion of the blood, and consequent diminished supply, and also to its altered qualities.

This conclusion then leads the author to institute a comparison between *asphyxia* and the effects of excessive loss of blood, in which he represents the former to differ from the latter chiefly by congestion of the venous system,—an inference, we think, not flowing very directly from the experiments.

Dr Kay next proceeds, in the fifth chapter, to consider the effects of wounds of the *parietes* of the chest, and to take a view of the resilient faculty of the lungs, in reference to the operation of *paracentesis,* especially as proposed by Dr Carson.

In the sixth chapter he inquires into the best means of effecting resuscitation; and after a full view of the practical directions laid down by Haller, Kite, Hunter, Goodwyn, Coleman, Bichat, Desgranges, and Leroy, assigns to the last author's method the most general degree of commendation.

The seventh chapter contains, with a comparison of the phenomena of *asphyxia* and *syncope,* a discussion on the history and merits of the operation of transfusion of blood for restoration from the latter state, and especially in that distinguished by Desgranges of Lyons, as taking place in various instances of submersion.

In the eighth and ninth chapters, in which the subject of *asphyxia* is again resumed, we find a discussion on the distinctive nature of different varieties of the accident, for instance, *asphyxia* from strangulation and suspension, from cold, from the non-respirable exclusive gases, and the non-respirable irritant gases, —and the remedies required by each kind.

Into the consideration of these subjects our limits will not permit us to enter at length, and we must entreat our readers who are curious to consult the volume for themselves. It is evident that Dr Kay has studied the subject with much attention; and we think that he has been usefully employed in diverting the attention of physiologists and pathologists to a point in the theory of *asphyxia,* evidently too much overlooked, and which is certainly of no small moment in regulating the nature and choice of the means to be adopted for effecting resuscitation. His treatise, however, would require not only much condensation, but some considerable alterations in method. The practical directions in the sixth chapter are a great deal too much blended with speculative reasonings; and the subjects discussed in the eighth and ninth chapters are also not sufficiently methodized and distinguished in arrangement.

The introductory letter may be recommended as containing a general view of the doctrines and practical deductions and rules of the author. Though rather long and prolix, it may be profitably perused by those who wish to understand the theory of *asphyxia* propounded and defended in the present volume.

We regret to observe, also, that Dr Kay has a singular fancy for expressing himself in an eccentric manner, and using unusual words. *Brainular* is not English, and has no authority except that of Dr Kirkland, the last person, we beg to say, to whom we should look as a model in writing. Would not *Cerebral* do quite as well. We do not think that Mr Brodie will be highly pleased with the compliment of being called an " astute " surgeon.

Art. X.—*The Transactions of the Provincial Medical and Surgical Association*, Vol. I. London, 1833, 8vo. Pp. 442. Vol. II. London, 1834. Pp. 546.

The receipt of the second volume of this valuable work reminds us that we have not yet made any mention of the first. We, indeed, took the earliest opportunity of laying before the readers of this Journal the interesting cases of *Aneurism* by Mr Jenning, and *Osteo-Sarcoma* by Mr Hetling ; but we have not hitherto introduced the work formally to the attention of our readers.

Though our limited space will not permit us to enter at large into the contents of these volumes, we feel that it is requisite to direct the attention of our professional brethren throughout the globe to the appearance of a work which promises to be so valuable. If our opinion of the first volume was favourable, we must say that the contents of the second make us entertain a still higher opinion of the work ; and we have no hesitation in saying, that, if the members of the Association proceed as they have hitherto done, they will in a few years present their countrymen with the most instructive digest of local medical information, which the records of any country possess.

It is scarcely requisite to say, that one of the great objects of the zealous founder of the Association was to collect materials on the medical topography of England, to provide a receptacle for hospital reports, and to afford a record for the various portions of isolated medical instruction coming under the observation of the provincial practitioners. In the wisdom of this proposition we most cordially concur; and we think that much valuable service may be rendered to the country by carrying this scheme into effect.

To show at once how much benefit may be effected in this way, we have only to mention, that the second volume, in which the arrangement is more complete and comprehensive than the first, consists of six parts.

The first contains an interesting address delivered by Dr Barlow, giving a view of the progress of Medicine and Surgery within the year.

The second part, which is devoted to the subject of Medical

Topography, consists of three most interesting and instructive articles. The first, by Dr Forbes, on the Medical Topography of the Hundred of Penwith, and the Land's-end in Cornwall, is written with the usual talent of that gentleman, and evinces information both in extent and precision which will long render it quite unrivalled. The second, on the Medical Topography of Bristol, reflects also great credit on the authors, Dr Carrick and Dr Symonds. And the third, which contains a Topographical account of Stourport and its vicinity, is ably performed by Mr Kenrick Watson. These articles, indeed, add much to the value of the volume.

The third part of the volume consists of essays on various subjects in medicine and surgery by different authors, all more or less interesting. We may specify that by Dr Joseph Brown of Sunderland, on the *Variations in the Production of Certain Diseases not usually supposed subject to Epidemic Influence*, as particularly curious and instructive.

The fourth part of the volume, devoted to Medical Jurisprudence, contains an experimental essay *on the Exact Differences between the Changes produced in the Lungs of Still-born Children by artificial Inflation, and those produced by natural Respiration;* and the fifth part contains two reports,—one of the Eye Infirmary at Birmingham for 1833, the other of the outcases of the Birmingham Infirmary attended by Mr George Parsons.

The sixth and last part of the volume is a very interesting account of the late Dr Darwall of Birmingham, by his friend, Dr Conolly of Warwick, written with a warmth of affection, and at the same time a degree of good taste, which we have very rarely seen united. Of this sketch we can only say, that we perused it with a degree of interest, with which we scarcely believed the biography of a physician could have been invested, till we saw it exemplified in the present instance.

The papers now enumerated prove how much useful informatiion, which must otherwise have been lost, or confined to limited circles, may be preserved, and rendered available to the progress and diffusion of medical and surgical knowledge. Among so numerous a body as the Association, it was reasonable to expect that there were many whose abilities, attainments, and opportunities, fully qualified them to communicate valuable information. But when we witness not a few, whom we know to be engaged in extensive and laborious professional duties, contributing their aid so efficiently, we think it must be admitted by all, that Dr Hastings has conferred on the profession a singular benefit, by concentrating the energies and promoting the intercourse of so many well-informed observers.

PART III.

MEDICAL INTELLIGENCE.

ANATOMY.

On the Distribution and Termination of the Nerves of the Hand. By M. Camus. (*From the Archives Generales de Medecine, February* 1834.) —By peeling the skin off the hand like a glove, the nerves are preserved, and it is easy to trace them farther than usual.

The nerves of the hand may be divided into two classes; those which terminate on the skin imparting to it sensibility, and those destined to impress on its muscles the motions necessary to bring it in contact with those objects, the qualities of which it is its office to appreciate. The termination of the latter in this region being the same as everywhere else, a few brief remarks will be all that is necessary.

The nerves which go to the muscles of the hand are exclusively furnished by the median and cubital. The first furnishes the muscles of the thenal; the second those of the hypothenal eminence. These two nerves anastomose to form, before the tendons of the flexor muscles, a superficial nervous arch, from which are sent two slender filaments, to be distributed to the first two lumbricales. The median forms the greatest part of this arch, whilst there exists another deep arch below the tendons of the flexors, which is furnished principally by the cubital nerve anastomosing in the first interosseous space with a branch of the radial. This deep arch furnishes a branch to each interosseous muscle, and one to the innermost portion of the *flexor brevis pollicis,* so that this muscle is furnished with branches from two nerves,—the median and the cubital,—and may be considered as double, according to the remarks of M. Chassaignac. Thus, from this deep arch, and not, as authors say, from the superficial arch, proceed the slender filaments which supply the last two lumbricales.

The tendinous parts placed in the hand are not furnished with nerves. In one instance only has M. Camus seen the tendon of the *flexor longus pollicis* receive a slender branch from the median. The cutaneous nerves are divided into those of the palmar, and those of the dorsal aspect. The median and the cubital furnish the former; the radial, and about half of the cubital, furnish the latter. The median and cubital are at once muscular and cutaneous, as far as the thenal and hypothenal eminences, inclusively. The radial is, on the contrary, exclusively cutaneous, from the middle of the fore-arm to its termination.

Of the nerves emanating from the superficial palmar arch, some are distributed to the angle of separation of the fingers; others form two collateral nerves for each finger.

Before arriving at the fingers, the collateral nerves invariably give off a branch, which anastomoses in the four interdigital spaces with a branch of the radial and cubital nerves on the back of the hand.

Arrived at the base of the fingers, the collateral nerves, undiminished in size, furnish each on the palmar and lateral aspects of the fingers numerous branches, which swell from the place of their separation from the common branch to their termination on the skin.

Their mode of termination in this region differs from that observed in the rest of the cutaneous tissue. If one of these nerves be carefully traced, it will be observed that it plunges into the dermis at a more obtuse angle than in any other part, and that this angle is enlarged in proportion as we approach the pulp of the fingers. There the nervous filaments, though sufficiently voluminous, are very short, disposed in diverging bundles, and appear formed of a less quantity of nervous pulp, considering their volume, than in the rest of their passage. Each bundle is insensibly confounded with the cellular tissue of the dermis, without our being able to affirm, in a positive manner, that it traverses it to form the papillæ which are observed under the epidermis. M. Camus has not observed any anastomosis on the median line of each finger, which some anatomists have described. On the sides there is constantly formed a voluminous branch, anastomosing with one of the dorsal collateral branches of which it is destined to supply the place at the extremity of the fingers which these do not reach. This supplementary branch is wanting on the external border of the thumb, and the internal border of the little finger, where the dorsal collateral branches exist throughout the whole length of these fingers.

On the dorsal aspect of the hand, the radial nerve and the dorsal branch of the cubital nerve are equally distributed over the fingers. But here the filaments, more slender and less numerous than in the palmar aspect, are not disposed like a tuft, and penetrate the skin in a direction much more oblique than those in the palmar aspect. M. Camus has not been able to verify the anastomoses of the dorsal branches on the dorsal aspect of the fingers, which are said by M. Lacroix to have been distinctly seen by him. The result of the dispositions which we have explained is, that the three principal nerves of the hand, viz. the median, radial, and cubital, communicate in a uniform manner on the palm of the hand at the angle of separation of the fingers and on their lateral aspects, whilst neither before nor behind is there discovered any anastomosis on the median line of the fingers.

Besides these differences in the mode of termination of the nerves in the palmar and dorsal aspect of the hand, there is yet a very remarkable one, consisting of the presence of little bodies, which M. Camus has seen occupying exclusively the palmar and the anterior half of the lateral aspect of the fingers.

From an attentive examination, M. Camus gives the following description:

In the course of the nervous filaments emanating from the collateral nerves, small opaque bodies are met with, pearl-white when first discovered, of the size of a grain of mustard, intimately connected with that filament only to which they are joined. Notwithstanding the difficulty experienced in separating these little bodies from the nervous filaments, M. Camus has been able to make out that they are continuous above and below with the same filaments, to which they are united by means of a very thin thread, scarcely distinct from the cellular tissue. Their number is nearly equal to that of the branches which proceed from the collateral palmar nerves. They are more or less closely situated to the termination of the nerves; but in general, after the production of these little bodies, the nerve does not divide more than once, to penetrate under the form of a tuft the dermoid tissue.

M. Camus considers that these belong to the nerves of the palmar region, and not to one nerve or another in particular,—an inference which he draws from their absence on those filaments which come from the dorsal branch of the cubital nerve. The question comes to be, is this species of ganglion nervous? In favour of this view may be adduced the fact, that water alters neither their colour, their volume, nor their form; and that, when macerated in a mixture of alcohol and water, they lose their brilliancy without changing their form, and scarcely their colour. The small fatty vesicles, with which these bodies have some analogy, have quite a different appearance when compared with them, and in no instance have such an intimate connection with the nerves.

The nerves of the plantar aspect of the foot present also these little bodies.

They are sufficiently numerous, especially towards the roots of the toes. Their volume is less than that of those of the hand, but, like them, they are found exclusively on the slender filaments which emanate from the collateral nerves of the toes from their separation to their extremities.

PHYSIOLOGY.

Of the Chemical properties of the Secretions in Health and Disease, and of the existence of Electrical Currents determined in organized bodies by the acidity and alkalinity of the membranes. By M. Donne, *Chef de Clinique Medicale a l'Hopital de la Charité.*—(*From the Journal Universel, Feb.* 1834.)

1. From the whole surface of the skin is secreted an acid humour. The sweat, however, instead of being, as is generally said, very acid under the arm-pits, and round the genital organs, is, on the contrary, as alkaline in these parts as at the toes.

2. The digestive canal from the mouth to the anus secretes an alkaline mucus, except in the stomach, where the gastric juice is very acid. Thus the saliva and the mucus of the œsophagus, as far as the cardia, are alkaline in a healthy state, and become acid only in consequence of disease. From the pylorus to the end of the intestinal canal, the mucus furnished by the mucous membrane itself is alkaline.

3. Serous and synovial membranes all secrete an alkaline liquor in a normal state, which in certain diseases sometimes becomes acid.

4. The external acid and the internal alkaline membranes of the human body represent the two poles of a pile, the electrical effects of which are appreciable by the galvanometer. Thus, in placing one of the conductors of the instrument in contact with the mucous membrane of the mouth, and the other in contact with the skin, the magnetic needle deviates fifteen, twenty, and even thirty degrees, according to the sensibility of the galvanometer, and its direction indicates that the mucous or alkaline membrane takes negative electricity, and the cutaneous membrane positive electricity.

Independently of these two great surfaces presenting opposite chemical states, there exist other organs, the one class of which may be called acid, and the other alkaline, and which produce the same result; between the stomach, for instance, and the liver of all animals, extremely powerful electrical currents are found.

5. M. Donné has observed electrical phenomena of the same kind in vegetables, of which he gives examples, but electrical currents in vegetables are not produced by the acid or alkaline states of the parts as in animals, because the juice of fruits, at least such as M. Donné examined, is throughout more or less acid. Accordingly, however, to the beautiful experiments of M. Biot, the juices which arrive by the pedicle are modified on some part of the fruit, and it is perhaps to this difference of the chemical composition of the juices of the two extremities that the electrical phenomena are to be attributed.

6. The acid humours of the economy may become alkaline, and *vice versa*.

7. Acidity is usually the result of inflammation, properly speaking, which may be produced by sympathy in an organ situated at a distance from the inflamed point. Thus the saliva becomes very acid in inflammation of the stomach.

8. The acid which is developed in inflammation appears to be most frequently the hydrochloric. The presence of this acid produces coagulation of the albuminous part of the lymph, or of the serosity which abounds in

inflamed parts. The false membranes in the serous cavities, the albuginous spots of the eye, the coagulable lymph of wounds, the thickenings of certain organs, and many other morbid productions resulting from inflammation, in which there is found by analysis only albumen, more or less coagulated, are owing to this.

Pus itself is produced by the action of the acid on albuminous lymph. It is a kind of union of the acid with the albumen. If free acid be not found in the liquids effused on the surface of inflamed organs, it is owing to the humours of the body being very alkaline, and containing sufficient potass and soda to neutralize the acid. In the memoir, however, of which this paper is a summary, M. Donné has cited many cases in which *pus* and even the serum effused into the abdomen in consequence of *peritonitis* were found acid. An analogous case was reported to M. Donné by M. Dumas, and another is mentioned by Berzelius in his treatise on chemistry.

9. The changes in the chemical nature of the secretions react on the different systems of the economy, forming an interesting order of lesions and symptoms in connection with the etiology, the diagnosis, and even the treatment of diseases. These changes, according to M. Donné, produce modifications of the electrical currents which exist between the different organs of the economy.

PATHOLOGY.

On some points of the History of Chorea in Children, by M. RUFZ, *interne à l'Hôpital des Enfans. (From the Archives Generales, Feb.* 1834.*)*—M. Rufz has collected some interesting facts regarding this disease, which we shall give in the shortest form possible under separate heads.

Of the Age at which Chorea is developed.—There were admitted into the Hospital for Children, during the ten years from 1824 to 1833, 32,976 patients; of these, 17,213 were boys, and 15,763 girls; of these, 189 were affected with *chorea*, viz. 51 boys, and 138 girls.

The following table will explain the proportion of cases at different ages.

Age.	Males.	Females.	Total.
1 to 4,	3	2	5
4 to 6,	2	3	5
6 to 10,	16	45	61
10 to 15,	30	88	118
	51	138	189

Causes.—Of eighteen children whose constitutions were carefully noted, fifteen were rather lean than fat, rather weak than strong. Three young girls, from thirteen to sixteen years of age, were evidently robust. The greater part of these had fair or chesnut hair, but two had black. In eleven the disease was attributed by the parents to fear; in the other seven it was developed without any fright. Neither the father nor the mother of any one of these eighteen had ever had an attack of the disease. In two cases only was there any other of the same family attacked. There were two little girls, each of whom had a sister afflicted, while their other sisters had shown no symptom of the disease. In three cases it was declared by the parents to be the result of other diseases. M. Rufz does not believe in the complaint being produced by imitation, because such a case has never occurred in the Hospital for Children, where a number of patients are annually admitted, and placed beside other children labouring under various diseases or convalescent. M. Rufz is not able to state from his own experience, whether the appearance of the menses contribute to the removal of *chorea*, as his observations were made on children under fifteen years of age, before which time they had not appeared. None of the patients had received any blows or wounds on the head. None passed worms, though valerian and other purgatives were administered, while other children who passed 100 or 150 *Ascarides lumbricoides* showed no mark of the disease. Intellectual labour seems to have no effect in producing chorea, as is evidenced by the answers to inquiries on this subject given by the masters and mistresses of the most celebrated schools of Paris, and by some of the physicians attending these institutions, particularly Messrs Alard and Husson. These physicians are of opinion, that chorea is perhaps more frequent among children educated at home than among those at public schools. Regarding the effect of climate and season, M. Rufz has collected the following facts. Dr Bariste, now deputy of the Gironde, in thirty years' practice in Martinique, never met with a case either among the negroes or the whites. Dr Garnett, who practised in the same colony, and M. Rochoux, who practised at Guadaloupe, met with none. Lastly, M. Chervin, who has traversed all the Antilles, never saw a case of chorea. As a contrast to these, M. Rufz has given the following results. Of 189 cases admitted in the hospital in ten years, 13 were in the month of January; 13 in February; 15 in March; 16 in April; 17 in May; 21 in June; 13 in July; 20 in August; 19 in September; 18 in October; 9 in November; and 15 in December. Although the numbers here are too variable to form any conclusions, it would yet appear, on the whole, that the hot months are the most favourable for the developement of chorea.

Symptoms.—These are sometimes limited to one of the extremities alone, and sometimes not only all the extremities are affected, but the trunk, face, and whole body are in continual agitation. At the beginning of the disease the movements are not decided, and are usually attributed by the friends to voluntary grimaces. At other times the disease appears more rapidly. Ewart, Dehaën, and Garchine, have observed that the left side is more frequently affected than the right, an observation which is corroborated by the facts stated by M. Rufz. Of twenty-five cases in nine, the disease was general, affecting the superior and inferior extremities, the trunk and face; in five the superior extremities alone were affected; in five the left limbs; in one the right; in four the left arm; in one the right arm. In two of the cases where the movements were general, they were more decided on the left side. These results were obtained before M. Rufz was aware of the opinions of the authors mentioned above. He has never seen it limited to both the lower extremities. After describing minutely the various irregular motions exhibited by the patients, he remarks, that the motions are more aggravated when the patient perceives that he is observed,—that the agitation usually ceases during sleep, but recommences on waking,—that waking is frequently preceded by a return of the movements,—that when the agitation is extreme, the patients sleep very little,—that the movements are not accompanied by any fatigue, and that the patients scarcely ever experience any pain, though he has met with two girls, fourteen years of age, who complained of pains in the articulation of the elbows and wrists. Headachs do not accompany *chorea*, and the patients retain all their intellectual powers, though they are more difficult to manage than other children, from their being more quarrelsome and capricious. M. Rufz has never met with any case in which palpitations or cardialgic pains accompanied this disease. Variations of atmosphere do not seem to produce any modification of it. The length of time that patients affected with chorea remain in the hospital, on an average of the 189 cases, was thirty-one days.

Of Chorea complicated with other diseases.—In the great majority of cases, *chorea* is unaccompanied by any other affection. In ten or twelve cases M. Rufz has seen patients labouring under it attacked by *variola*, *scarlatina*, measles, and some acute diseases, as *pneumonia*, *peritonitis*, &c. These complications have had no influence on the duration or intensity of the disease either before or after.

Appearances on dissection.—It is very rare that patients die while affected with *chorea,* and then only in consequence of some other disease intervening. The following are the conclusions given by M. Rufz: 1*st,* that the instances of organic alterations in *chorea* are very rare; 2*d,* that among the alterations mentioned by authors very different pathological lesions are found, and in general rather indicated than described; 3*d,* that the observations collected by himself give only negative results, that is, he has met with no lesson which may be considered peculiar to *chorea*; 4*th,* that, *a priori,* it is probable that *chorea* does not depend upon any permanent alterations, if we take into consideration its frequently intermittent type. Congestions are the only anatomical lesions which present this character.

We need not give here the author's abstract of the various plans of treatment proposed. Of these the reader must be well aware. We may mention, however, that M. Baudelocque considers baths in which the sulphuret of potass has been dissolved to be quite specific, and that the same agent has been successful in the hands of Buffos, Guersent, Bouncau, and Jadelot.

Defective formation.—M. Bourdois presented to the Royal Academy of Medicine, at their meeting on the 7th January last, a young man born without hands, without fore-arms, and without feet. Each leg was formed only of a tibia covered with skin. It was without the fibula and its muscles. The individual is obliged to walk on his knees.

THERAPEUTICS.

On the Employment of Creosote, by Dr Berthelot. *(From the Lancette Francaise, Feb.* 1834, *and the Bulletin General de Therapeutique, Feb.* 1834.*)*—Before laying the substance of M. Berthelot's articles before our readers, we would call their attention to a paper by Dr Davy on the *Acqua Binelli,* which will be found in the fortieth, and to an account of *Creosote,* which appeared in the forty-first volume of this Journal. A perusal of the paper of Dr Davy will be sufficient to excite the suspicion, that *creosote,* or something analogous to it, is present in the *Acqua Binelli.* The alleged effects of the preparation called *l'eau creosotée,* appear to be the same as those attributed to the *Acqua Binelli.* With these remarks we give an abstract of M. Berthelot's experiments.

The first two cases were those of patients who had varicose ulcers.—Of one of them nothing need be said, as the solution of *creosote* was applied only for two days, and then discontinued for some cause not mentioned. During these two days, however, the suppuration and disagreeable smell are said to have been suppressed. The other patient was in excellent health, and had a good constitution. The ulcer was of ten years' standing. On the 16th December, the solution of *creosote* was applied by means of cotton soaked in it. The suppuration and bad odour disappeared after the first application. Some days afterwards a thin pellicle appeared on the top of the ulcer. In ten days it recovered three-fourths of it, and by the 22d January it was completely healed. We suspect that all this might have been done with cold water; and we are in possession of some facts showing the rapid cure of ulcers of the legs, both from *varices* and other causes, by cold water dressings and rest. The next patient, a child eight years of age, was affected with suppuration of the external auditory canal of the right ear. Two or three drops of the solution of *creosote* were poured into the ear, and the suppuration ceased. The same was repeated several times, and the suppuration did not return. The other cases we shall not enter into, but content ourselves with simply enumerating them. We have, then, one of abundant suppuration following the excision of a tumour from the *anus,* cured in twenty-seven days,—one of a burn on the wrist, of the size of a franc piece, on which a crust was formed in five days,—one of an eruption on the chin, with a serous suppuration,* cured in eight days —a syphilitic ulcer of the *penis*, previously treated with mercury without effect, cured in eight days,—an extensive burn cured, part of it in five, part of it in twelve days,—two fingers cut with glass cicatrized in five days,—toothach from carious teeth cured by one application,—a cut finger cured in four days,—and an obstinate dartrous ulcer, near the elbow of a child, cured in six days.

On these experiments M. Berthelot makes the following observations: —The first and third patients experienced no pain on the application of the solution of *creosote*. Even pure *creosote* itself had no effect on the first. In his case, chronic inflammation of the cellular tissue had so hardened the skin and the subjacent tissues, that it appeared inert, and altogether uninfluenced by the action of the nervous system. In the other ten, the application of *creosote* produced pain, more or less acute, according to the susceptibility of the individuals.

In five, *creosote* acted as a disinfecting agent, restraining or destroying the bad smell. In seven, by its presence it stopped suppuration. In four, where suppuration had not occurred, it cicatrized the wounds without permitting them to suppurate, as happens when they are left to themselves.

Of the Influence of Gravity on the Circulation, and the Phenomena which are derived from it, and of the Elevation of Diseased Parts considered as a means of Cure. By M. Gerdy.—*(From the Archives Generales, December* 1833.*)*—Whatever influence the heart and vessels may exercise on the circulation, the circulating fluids are also influenced by gravity. But the fluid in the arteries and that in the veins, flowing in opposite directions, it follows that gravity must produce on these two currents opposite effects. In fact, if it accelerates the motion of the one it must retard that of the other, and produce in certain parts congestion, alterations, and predisposition to inflammation. When inflammation exists, it must increase it.

Man's most usual position is the vertical, whether he be standing or sitting. In consequence of this attitude, which favours in the lower extremities the arterial circulation, while it opposes the venous circulation, and produces engorgement of the venous system, man, as he advances in age, sees his legs become the seat of *varices*, of chronic engorgements, and, in fine, of ulcers more or less obstinate. These affections, so common, are peculiar to the inferior extremities, and are, owing to the blood enclosed in the veins pressing on their parietes, distending them, and weakening their elasticity. Hence slackening of the circulation, engorgement of the tissues, and a predisposition to consecutive ulcerative inflammations.

In the head, on the contrary, from its habitual elevation, the venous system easily relieves itself of the blood which it contains; and then, assisted by gravity, it is in a state of relaxation. The venous system experiences a sufficiently powerful tension when the horizontal position of the body withdraws the circulation from the direct influence of gravity, and then the head is in a state of congestion, because its veins, in general almost passive, have too little contractile force, in consequence of the few efforts they have to make, and are easily distended when the circulation of the blood is not favoured by its gravity.

Thus, in the inferior extremities, the elasticity of the veins is weakened by their almost continual distension. In the head it is weakened because it is not exercised. The same happens in all parts of the system, only in different degrees. In almost every part of the body the venous and capillary systems are, from the action of gravity in various situations, subject to alternate tension and relaxation, whence results progressive relaxation of the parietes of the veins, causing them to become more and more liable to distension. Thus the effects aid the cause and increase its power.

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* *Une suppuration sereuse.*

M. Gerdy proceeds to give a view of the influence of gravity in health and disease. To an abstract of the latter we must restrict this notice. If the action of gravity be sufficient in a healthy state to produce at length morbid affections, organs which are already diseased must feel its influence more. Thus, in acute inflammations situated in the head, the symptoms, especially the pain, are augmented by a horizontal position, and there is a desire to have the affected part elevated. This must occur also in inflammations of the brain and its membranes, though the patient, from the disordered state of the intellect, cannot reflect on his sensations. Thus it is rational to raise his head. Farther, when inflammations are situated on one side of the head, they are increased by lying on that side, and alleviated by turning to the other; and thus inflammation is sometimes transferred from one eye to the opposite, if the patient recline on the unaffected side. This is much more apparent in inflammation of the pituitary membrane, which, in the acute stage, can almost at pleasure be transferred from one side to another. In inflammation of the ear, the side of the head, or one of the tonsils, the same phenomenon appears.

In the neck the influence of gravity is not so great, from the small diameter of the part, yet similar phenomena occur. The same takes place in the rest of the trunk, and erysipelas often spreads rapidly to the dependent side, leaving the part which it first attacked, so that the rapid transmission of this disease is not owing to its erratic nature alone. The most frequent seat of pneumonia is the depending portion of the lungs, and it is probable that some of these cases of pneumonia which supervene as it were accidentally at the termination, or during the progress of tedious diseases, are in a great measure the result of gravity acting on individuals kept long by weakness in a supine position, and producing stagnation of the blood in the lungs, consequently engorgement, and finally chronic inflammation, which disorganizes the tissues. In like manner, critical abscesses often manifest themselves on the most dependent parts.

Hemorrhoids, engorgements, chronic inflammations, and hemorrhage from the uterus, may be caused, or at least have their developement favoured by gravity, and the same influence must irritate and aggravate them when they exist. This is exemplified in hemorrhoids becoming more painful after long standing or sitting; in diseases of the uterus requiring rest for their cure; and in affections of the testicles, scrotum, and penis being aggravated by the erect posture. Hence the importance of the rule, to withdraw these parts from the influence of gravity whenever they are diseased. In inflammations of the superior extremities the patient naturally does what a rational physician would recommend, and withdraws the affected part from the influence of gravity. In the lower extremities the effects of gravity are completely analogous; and ulcers, wounds, &c. of these parts are in general intractable till they have been removed from the dependent posture.

Such is the effect of gravity on diseases in every region of the body. In general all diseases characterized by an afflux of blood, or complicated with more or less of congestion. All those which by their nature produce in organs an irritation capable of bringing on congestion are increased or aggravated by gravity. Inflammations, wounds, fractures, luxations, sprains, tumours of a chronic nature, white swelling, all are aggravated by this principle. Serous effusion, whether in the form of *hydrothorax*, *anasarca*, or *œdema* is under the same influence. In a word, the influence of gravity on the fluids circulating in our vessels is sufficient to produce sanguineous and serous congestions,—always severe, sometimes deadly,—inflammations, and all the accidents which supervene, ulcers, abscesses, partial gangrenes, alteration of tissues. It gives rise to varices, and all the alterations which accompany them, and perhaps in certain cases to the formation of a sort of spongy tissue. Perhaps also it has some influence in producing ossification of arteries, which happens so often in the lower extremities, and the gangrene of old age. When it continues to act on diseased organs, it never fails to increase the evil when it can be aggravated by sanguineous congestion; and wherever in its passage it finds a principle of irritation, it stimulates it, and causes it to produce deadly consequences. Other proofs of its power are to be found in diseases produced by its being cured by neutralizing its influence,—in its displacing acute and intense inflammations, such as *ophthalmia* and *erysipelas,* and in good effects being produced in other diseases, by causing it to act in a manner the reverse of irritation, which produces congestion in some part of the economy.

The uses to which this may be applied in therapeutics are various. To enumerate them would be tedious. It is enough to state, that it may be sometimes employed as a principal, more frequently as an auxiliary, remedy in all diseases accessible to its action, which partake more or less of the nature of inflammation, and in all those complicated with any determination or congestion of blood.

CHEMISTRY.

On the Action of Chlorine on Metallic Iodides. By A. T. THOMSON, *M. D. Professor of Materia Medica in the University of London.—(From the London and Edinburgh Philosophical Magazine, June* 1834.*)*—It is well known that liquid chlorine, or a solution of chlorine in water, when added to solutions of metallic iodides, or, as they then become hydriodates, sets free the iodine, which can then be detected in minute quantities on the addition of starch. A small excess, however, of the liquid chlorine destroys the colour of the iodide of amidine, and renders the test fallacious. To obviate this, Dr Thomson has substituted chlorine gas for the liquid chlorine, which he finds capable of discovering the minutest portion of any hydriodate in solution, even in mixed fluids. The following is the method pursued:—Mix a small quantity of solution of starch in the fluid to be tested, and pour on the surface of the liquid some chlorine gas. "As soon as the gas reaches the surface, a thin film of blue appears, and gradually pervades the whole of the liquid, if any hydriodate be present. The advantage of the test is the impossibility of adding too much, as the action commences on the surface, and the superabundant chlorine, which is mixed with the common air in the upper part of the test tube or glass, is soon dissipated." This test will detect the nine hundred and sixtieth part of a grain, which is quite adequate for any experiment in which it may be required to ascertain the presence of a hydriodate in solution.

TOXICOLOGY.

On the Poisonous Effects of the Cyanuret of Potassium administered as an Enema.—(From Journal de Chimie Medicale, January 1834.*)*—M. Trouvé, Professor in the Secondary School of Medicine of Caen, has communicated the following fact to M. Orfila:—

A patient affected with neuralgia of the trunk took three enemata, each composed of six ounces of water and six grains of the cyanuret of potassium *moistened,* but yet in a mass. The first and the third were administered cold; the second was heated in a water-bath, keeping the bottle corked. All the three occasioned strong convulsions, violent contraction of the limbs; the eyes became fixed, the pupils were dilated. At last the patient found himself better, and able to rise, which he had been unable to do for a year.

A fourth enema of the same ingredients as the former, except that the cyanuret of potassium was *boiled in it, and so moist* that it adhered to the sides of the injection bag, was administered to the same patient, who felt no pain, and no accident followed.

A fifth enema, given thirty-six hours after the fourth, prepared with the same quantity of well-dried cyanuret, was taken in an injection bag, which had not yet been opened, and which exhaled little odour. The patient died at the end of an hour after presenting the following symptoms;—general convulsions, violent action of the heart, slow and difficult respiration, coldness of the extremities, dilatation of the pupils, eyes fixed.

This fact establishes a marked difference between the dry and moist cyanuret of potassium: the latter appeared much less active. It is not probable that this was because it had not been decomposed by the action of moisture?

The experiments of M. Pelouze are in favour of this opinion. By heating a concentrated aqueous solution of the cyanuret of potassium he transformed it into ammonia and formiate of potass, which is inert. Whatever it may be, account must be taken of the quantity of water contained in the cyanuret which was boiled, which ought necessarily to diminish the real quantity of the cyanuret of potassium contained in it.

MATERIA MEDICA AND PHARMACY.

On Delphine. By M. Couerbe. (*From the Journal de Pharmacie, October* 1833.)—This alkaline substance, discovered by Messrs Lassaigne and Fenuelle, was obtained by them from the *Delphinium staphisagria* by a process similar to that by which morphia is prepared from opium. The following is the process employed by M. Couerbe. It is important that the *Delphinium* should be gray or slightly brown, because that which is black does not produce much *delphine*. The seeds are to be bruised to a paste, and treated with boiling alcohol at 36° (sp. gr. 0.8252). An extract is then formed, which possesses a blackish-red colour, and is of a greasy nature, and very acid. It is boiled with water acidulated with sulphuric acid, until a mineral alkali thrown into it produces no precipitate. In this way the delphine is taken up in the state of an impure sulphate, and is separated from the great quantity of greasy matter with which it is united. On pouring a solution of potass or ammonia in the liquid impure sulphate of *delphine*, the base is precipitated. This contains impurities which may be removed in a great measure by treating it with boiling alcohol, passing the tincture through animal charcoal, filtering and evaporating it. Sometimes before pulverising the delphine, it is formed into a sulphate and precipitated anew, which is preferable to pounding it, as the powder is more subtile, white, and light. In this way fifty-five or sixty grains may be obtained from a pound of *Delphinium*. The product, however, is not in its greatest purity; it further contains foreign substances which may be removed by the following process. The *delphine* is to be dissolved in water, acidulated with sulphuric acid, and filtered. Drop by drop nitric acid of the usual strength, or diluted with half its weight of water, is to be poured on the solution, by which a great quantity of a red sometimes very black resinous matter is precipitated; the liquid is in a great measure deprived of colour, and becomes, as might be supposed, very acid. Care must be taken to add acid till the precipitation ceases. The appearance is very remarkable, for the temperature is increased somewhat, and the precipitate is formed as it would be under the influence of an alkali. In this experiment care must be taken to dilute the sulphate with sufficient water, otherwise the resinous matter on being precipitated would carry the delphine down with it. After leaving it to rest for twenty-four hours, the resinoid matter is glued to the bottom of the glass, and the liquid may be poured off so clear as not to require to be filtered. The glass in which the precipitate is formed is washed, and the washings added to the solution of *delphia*, which is then decomposed, by adding to it a weak solution of potass. This is separated by filtering, and washed several times with water. By forming a tincture of it with alcohol at 40° (sp. gr. 0.8095,) filtering it anew, and distilling it, there is obtained a matter of a resinous appearance, slightly yellowish, and very alkaline, which is first to be washed with boiling distilled water to separate it from the nitre, and with ether, which dissolves the alkali, and leaves a residuum.

The delphine of commerce thus contains three substances; 1st, a resinous matter, which is of little consequence; 2d, a substance to which M. Couerbe has given the name of *Staphisain;* and 3d, pure *Delphine.* All these are soluble in alcohol, and in water acidulated with sulphuric acid; the resinous matter is separated by the nitric acid, and *staphisain* by ether.

The composition of Staphisain is as follows:

Carbon,	73.566
Nitrogen,	5.779
Hydrogen,	8.709
Oxygen,	11.946
	100.

Delphine, obtained pure by the process given above, is of an appearance slightly like amber, acquires by division a colour almost white, is soluble in ether, and more so in alcohol,—scarcely in water at any temperature. Its taste is insupportable, from its acridity, which is felt in the throat, and remains for a long time. It does not crystallize. At a temperature of 120° (238° F.) it is fusible. Dilute acids dissolve without altering it; concentrated acids decompose it. Chlorine acts in a remarkable manner on *delphine.* At ordinary temperatures there is no action, but at 150° (282 F.) or 160, (317° F.) it attacks it actively, changes its colour into green, then into a deep brown, and renders it excessively friable. During the experiment it forms hydrochloric acid. The mass, which before was soluble in alcohol, after the operation is only partly so. Ether, too, dissolves but a part of the matter, which is as different from what the alcohol dissolved. In fine, there remains a pulverulent residue of a deep chesnut colour. The proportion of azote to carbon in these three compounds is absolutely the same.

The chemical composition of delphine.

Carbon,	76.69
Azote,	5.93
Hydrogen,	8.89
Oxygen,	7.49

Of Veratrine. By M. Couerbe. (*From Journal de Pharmacie, October* 1833.)—According to all known processes, this principle is very difficult to obtain; but by the same by which *delphine* is procured, it may be prepared without the least difficulty; and by not purifying it with nitric acid, one gros (59.1 grains,) may be obtained from each pound of the *Veratrum sabadilla.*

According to M. Couerbe, this is not a simple substance, but contains at least three, one of which is entirely new, and capable of being crystallized perfectly well. To these three substances the names sabadilline, gum-resin (*resinigomme*) of sabadilline, and veratrine are applied.

The composition of these substances is as follows:

Sabadilline.		Gum-resin of sabadilline.	
Carbon,	64.18	Carbon,	60.998
Azote,	7.95	Azote,	7.230
Hydrogen,	6.88	Hydrogen,	7.251
Oxygen,	20.99	Oxygen,	24.521

Veratrin.	
Carbon,	67.39
Azote,	6.28
Hydrogene,	7.20
Oxygen,	19.13

It is unnecessary to give here all the properties of pure veratrine. We shall content ourselves with giving such as M. Couerbe has discovered, omitting those given by MM. Pelletier and Caventou, which are to be found in volume 18th of this Journal, and in most elementary works.

Veratrine appears under the form of a resin, almost entirely white, uncrystallizable, solid, friable, fusible at 115° (239° F.) Writers have placed this point much lower. M. Couerbe cannot account for this. Like alkalis, it reacts on the reddened tincture of turnsol; it combines with, and saturates acids, forming with them various crystallizable salts. The base is almost insoluble in water. Alcohol and ether are its best solvents. Chlorine produces no remarkable reaction with this substance. The property of forming crystallizable salts was not observed by its discoverers, for they did not describe any of its salts, and no one since them, as far as M. Couerbe knows, has remarked it.

With reference to the question of priority in recognizing this property, it is requisite to say, that while the paper of M. Couerbe was read on the 20th May 1833, seven months previously Professor Turner had mentioned this property of *veratria* in his Elements of Chemistry, fourth edition. The date of the edition is 1833; that of the preface 20th October 1832; and we know that this edition of Professor Turner's Elements was in the hands of the booksellers in December 1832.

The Medical Properties of the Apocynum Cannabinum or Indian Hemp. By J. H. Griscom, M. D. New York. (*The American Journal of the Medical Sciences, May* 1833.)—The Indian hemp belongs to the natural family *Apocyneæ*, and is indigenous in North America, especially Virginia and Canada, where it is also named Dogs-Bane. The root is creeping; its stem brown, two feet high; the leaves smooth, alternate; the flowers disposed in little knots of a whitish or herbaceous colour, flowering between July and September; and the plant contains a milky juice. The bark of the stem when dry is very fibrous, and enables the Indians to use it in the manufacture of bags, threads, and fishing-lines, and even cloth.

The root, which is the only part used in medicine, is very tortuous, and consists of two distinct portions; the body covered with bark, and the woody portion, which is yellowish, very bitter, and without smell. It contains tannin; 2. an acid, perhaps gallic; 3. gum; 4. resin; 5. wax; 6. *fecula*; 7. *apocynine*, a bitter principle; 8. colouring matter; 9. woody matter. The milky juice is conjectured to contain caoutchouc. When introduced into the stomach, it causes first squeamishness, then vomiting, afterwards, if in sufficient quantity, copious liquid stools, and profuse sweating. Though its effects on the kidneys are not always well-marked, it has been found a good diuretic.

According to the experience of Dr Griscom, the Dog's-Bane root is a very effectual remedy in various forms of dropsy, especially *ascites*, when unattended with symptoms of much fever or inflammatory action. It should be administered in decoction in the proportion of two ounces of the root in three pounds of water boiled to two; of which one or two cups may be taken three times daily according to its effects. It has also been given in powder in doses of three or four grains three times daily made into pills.

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PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Select Cases and Communications, forming part of the* TRANSACTIONS OF THE MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH. Communicated by the COUNCIL.

PROSPECTUS BY THE COUNCIL.

[*Not long ago the Medico-Chirurgical Society of Edinburgh circulated among its members and friends a proposal, that they should communicate to the Society, for accumulation in its records, any detached cases of interest which might occur in the course of practice,—the object being to preserve and make known a class of facts, which, however valuable, the Society were well aware must often escape publicity, because they present themselves to practitioners who entertain, either in the particular circumstances, or even generally, no views of becoming authors in the ordinary form. A considerable collection of important cases has accordingly been now made; and these, as the Society originally anticipated, have acquired by their relations to one another, an interest which, intrinsically or severally, they never could have possessed. It has now, therefore, become the duty of the Council to decide how these cases may be published in such a manner as to meet most amply the views of their authors and of the Society; and the result is, that, with the concurrence of the Editors of the Edinburgh Medical and Surgical Journal, they have resolved to insert as regularly as possible in the* *quarterly numbers of that Journal, a digested series of such cases as have met with their approbation. The present Section, being the first part of a series of Diseases of the Brain and Nerves, may be considered as a fair specimen of what may be expected from the Society's plan.*

It is to be understood that no cases or communications will appear in this Journal under the head of the Medico-Chirurgical Transactions, except such as have been read before the Society and approved by its Council; and that the Council exercises the sole control in the admission or refusal of articles.

The Council feel it wholly unnecessary to point out the advantages which may be looked for from the steady execution of the plan which the Society has sketched out for itself. They will venture, however, to express to the members of the Society, as well as to its numerous friends, their hope that the fortunate agreement they have made with the Editors of this Journal,—in consequence of which they are able to secure certainty and promptitude of publication for all communications of value,—will induce contributors to come forward in increased numbers. The second Section will probably comprehend Diseases of the Abdominal Viscera.

The Council have it farther in contemplation to append to each Section an abstract or general summary of the cases contained in it, wherever such summary seems practicable and likely to prove useful. But, for obvious reasons, this is a part of their plan which they cannot pledge themselves uniformly to execute.

SECTION FIRST.

Cases and Communications illustrative of the Pathology of the Brain and Nerves.

§. I.—MORBID CHANGES IN THE EXTERNAL MEMBRANES OF THE BRAIN.

1. *Case of Ossification and Preternatural Aridity.* By ALEXANDER HOOD, Esq. Surgeon, Kilmarnock.

AGNES BUCHAN, aged 28 years, was sober, industrious, and attentive to business early and late. She had little time for air or exercise; and tea, bread, and butter, constituted her diet morning and evening, for she took little dinner in general for many years. In October 1827 she complained of palpitation of the heart, which continued more or less severe till January 1828, when the disease in a great measure disappeared. From this time till the month of May she enjoyed tolerable health, though somewhat delicate and nervous. The catamenia appeared regularly.

On the 24th of May, while menstruating, she walked fourteen miles out and home with a pleasure party without inconvenience. On Monday the 26th, she was much engaged in cleaning a room, and in taking the curtains off a bed, washing them, and putting them up again.—On the 27th, she complained of being stupid and confused, and of want of recollection.—On the 28th she had a slight attack of epilepsy, was sick and oppressed during the day, and vomited frequently.

On the 29th, she had some vomiting; palpitation occasionally troublesome; complained of being confused, and of having considerable pain about the back of the neck, but particularly the upper and back part of the head; pulse 72; countenance pale; almost bloodless; bowels in general costive. The head was ordered to be shaven, and eight or ten leeches applied to the pained part; and she was requested to take an ounce of castor oil immediately. This was the first time I had seen her.

June 1st. The oil had been rejected. She now complains of palpitation of the heart, of nervous debility, and a confined state of the bowels.—2d. She took two ounces of a solution of sulphate of magnesia, in which were dissolved eight grains of the sulphate of iron. Soon after taking this solution, she began again to vomit, and vomited very frequently during the day, and occasionally brought up some bile. Pepper and whisky were applied to the stomach, and an opiate administered to procure rest during the night.—On the morning of the 3d inst., the vomiting returned; pulse 72; took a Seidlitz powder; and shortly after an enema was thrown up, by which some dark-coloured feces were evacuated; but in rising from the stool, the right leg, and also the right arm, were found to be paralytic.

In the evening I learned that she had had several convulsive attacks in the course of the afternoon; incoherent; countenance pale; eyes staring and wild; pulse 110, full and strong. She was bled to the extent of sixteen ounces from the arm, and ten leeches were applied to her head. In the course of the night she had a great many convulsive attacks, or epileptic fits, which exhausted her so much that about mid-day on the 4th she expired.

Dissection.—On dividing the scalp to remove the skull-cap, not a drop of blood was lost, nor was a blood-vessel to be seen. The cranium was of the usual thickness; and near the coronal region, on the right side, was a small ossified projection on the outer plate of the bone, in shape and appearance much resembling a split pea, though somewhat larger in size.

Within the skull, a little anterior to the commencement of the lambdoidal suture, and on each side of the longitudinal sinus, spiculæ of bone were formed, about half an inch in length, and one-third of an inch in breadth. The sinus was completely filled with a hard coagulum of blood, so that when the vessel was cut open it retained its form, and had so much consistence that it resembled very much a portion of boiled blood-pudding. On the left hemisphere of the brain, immediately under and posterior to the coronal suture, the membranes covering the brain in this part were very fully injected with blood, so strongly coagulated in the vessels, that their contents could not be pressed backward and forward, as is usually the case. It was found necessary to slit open the veins in this place, in order to examine the coagulum. About the middle of the left lobe, near to where the falx divides the two hemispheres, a clot of blood was discovered in the substance of the brain, about the size of a small bean. About two and a-half inches farther back, nearly under the ossified portion of the sinus, but still in the left hemisphere, there appeared to be some disorganization,—the cerebral substance being soft, and containing several clots of blood about the size of a pea. There was not a drop of serum discovered in this dissection of the brain, no effused lymph, and scarcely even a drop of fluid blood was observed.

The lateness of the hour—it being midnight—prevented me from examining the chest and abdomen.

Kilmarnock, June 9, 1828.

2. *Tumour from the Petrous Portion of the Temporal Bone, with extensive Disease of the Brain.* By Dr BEILBY, F. R. C. Physicians, Edinburgh.

A gentleman, aged 31, who had enjoyed remarkably good health, became affected, in March 1830, with pain in the right ear, from which a discharge of purulent matter soon took place, after which the pain abated, but returned occasionally with violence for a short time. In the following June, the ear, which had continued to discharge, was again the seat of constant acute pain, and the discharge ceased. He now began to suffer extreme pain in the head, for which he took a great deal of medicine,—especially mercury. Discharge from the ear again took place, with great mitigation of the headach. But from this time he continued very subject to pain in the head, varying in degree, and in its particular seat, being sometimes felt chiefly in the back of the head, at other times above the eyes, but most frequently on the right side, and described by him as shooting from the ear towards the vertex. It sometimes ceased suddenly, and without any known cause, and he had perfect ease for two or three weeks.

I first saw him about the beginning of last December, at which time he was suffering violent pain in the head, and had a constant sensation of noise in the right ear, the function of which was so much impaired that he could only distinguish pretty loud sounds on that side.

Leeches, blistering, and purgatives, produced no sensible benefit.

On the 23d of January he was found lying on the floor of his bed-room in a state of stupor, and when roused, he said he had fallen out of bed, but could not give any intelligible account of it. His mind was confused, and his speech indistinct. There was a constant tendency to fall into a state of sopor, from which he was very unwilling to be roused, and when raised up, said he had great pain in his head. On the following day he died.

Appearances in the Head on Examination.—The general surface of the brain was dry. There was from an ounce and a-half to two ounces of serous fluid in the lateral ventricles. The parietes of the lateral ventricles, the *septum lucidum*, and the *fornix*, were in a softened state. There was a firm tumour about the size of a horse-bean upon, and apparently growing out of, the ridge of the petrous portion of the temporal bone, imbedded in, and united to, the brain itself, which could only be removed from the skull by the laceration of this adhering part. There was a large abscess, with unhealthy scrofulous-like matter on the anterior surface of the *cerebellum*, affecting both hemispheres, and involving both the *crura cerebri*. The contiguous portion of the *tuber annulare* and the *medulla oblongata* were in a softened state.

It may not be without its use to advert to some circumstances in this case which are worthy of remark, as exhibiting coincidences very likely to embarrass the judgment, and which did for a while mislead mine. The symptoms appear to be decided and unequivocal, and the diagnosis perfectly obvious. The pain of the head, generally referred to the right side, especially to the ear, the impaired function of that organ, and the purulent discharge from it, all seem to point out the very disease which the subsequent examination developes. When I first saw the case, I entertained no doubt that such was its nature. But the failure of the remedies employed to mitigate, even in any degree, the symptoms, the entire remission of the pain at times, without any remedy, and that even for weeks,—the inconstancy of the pain, as to its seat also, and its being often referred to particular parts of the face, as well as the head, especially to a point a little below the inner angle of the right eye, to the *ala nasi* of the same side, and sometimes to the *symphysis menti*, all concurred to induce me to think that it might not be *neuralgia*, and that the abscess of the ear might not be connected with any deep-seated disease. The effect of the remedies I prescribed under this notion seemed for a time to sanction it. The pain of the head ceased while he was taking large doses of quinine.

A second trial of it, indeed, proved inefficacious. I was then induced to order Fowler's solution, during the use of which there was an entire remission of pain; but this also failed on a subsequent trial.

Dec. 7, 1831.

3. *Case of Inflammatory Suppuration of the Internal ear passing to the dura mater and brain.* By WILLIAM BROWN, Esq. F. R. C. Surgeons, Edinburgh.

James Johnston, aged 14, a robust and vigorous boy, but liable to occasional attacks of abscess of the ear, complained of pain in his right ear, and vomited once or twice on Wednesday the 12th January 1834. He continued at school till Saturday, but still complained of pain, and had the appearance of inattention and stupidity. I did not see him till Monday 17th. He was then in bed, complaining of severe pain of the ear; the integuments around the ear were tender, but very slightly swelled. The tongue was very foul; he had a good deal of wheezing; and the pulse was quick and hard. He was almost deaf in the affected ear, and this gave him an appearance of stupidity, as he lay on the other side. No matter flowed from the ear, as had done in previous attacks. I ordered leeches to be applied around the ear, and to be followed by a large poultice.

18th. Pain continues very severe. He has a good deal of drowsiness; pulse about 70, and small. I ordered the head to be shaved, and the poultice continued. In the evening he was rather easier.

19th. Rather easier. Pain and tenderness considerably abated; very slight swelling behind the ear. Late in the evening, his breathing became very laborious, and a blister was applied to his chest. I did not see him till next day.

20th. I learned that he had been quieter in his breathing through the night, but had once or twice a recurrence of the dyspnœa. When I saw him, he was quite intelligent, and was not suffering much pain, nor was his breathing very uneasy. I found a considerable swelling behind the ear, which I laid open, and discharged a good deal of very fetid matter. I felt the mastoid process to be bare to a considerable extent. In the evening I took Dr Alison with me about eight, and found him moribund. He was quite comatose, with slow and very laborious breathing; pulse about 180; the right pupil contracted, and left dilated. He died before we left the house.

The body was opened thirty-nine hours after death. The skull-cap came off very easily. There was no moisture on the arachnoid. The brain when cut into showed a number of red points; but its texture did not seem in any respect diseased.

The lateral ventricles contained two or three ounces of serum. When the brain proper was removed, the *tentorium* on the right side appeared thickened; and on its being slit open, the lower surface appeared covered with pus. No other morbid change was visible.

The bone immediately adjoining the diseased membrane was of a darker colour, but was not carious. Around the external ear the bone was bare, but not otherwise diseased.

Two or three gristly tubercles appeared on the pulmonic pleura. But the lungs on both sides were in no respect diseased.

The narrative of this case is defective, from its giving no distinct information respecting the symptoms for five days. We are thus ignorant of its progress during the period which is most interesting in a practical point of view, and we do not know whether it had been caused by external injury, or by exposure to cold. The symptoms observed during the last four days, and the appearances recognized after death, do not remove this uncertainty; but they render it more probable that the *dura mater* was primarily affected, and that the collection of matter under the *pericranium* was the consequence of the internal inflammation.

4. *Case of Meningitis, with gelatiniform softening and perforation of the Stomach.* By A. Hood, Esq. Kilmarnock.

James Macmillan, aged 7 months, has, during the last five or six weeks, been affected with slight catarrhal symptoms. December 25. He seemed to be more affected than usual with cold, and has a livid circle round the right eye.—On the 26th, The left arm was observed to hang in a debilitated state by his side; still he can raise it to his head, but when it is moved or handled he cries bitterly. He was feverish and restless during the night.—On the 27th he slept little, his sleep being disturbed with starting and screaming.—On the 29th, the left arm, about the shoulder, was swelled and painful, supposed to be from a wrench, or some unobserved casualty he had sustained. He takes the breast well, though evidently sick and oppressed. The arm to be rubbed with strong spirits, and the temperature supported by means of warm flannel. Bowels easy, or rather lax, and he makes water freely.—On the 31st, symptoms somewhat aggravated; no power of motion in the arm, though he can move the hands and fingers.—January 1st. Took a grain and a-half of calomel, which operated well; and he continues to make water abundantly.—2d. He seems to be very sick and much oppressed. The anterior fontanel was projecting, and the integuments tense and elastic; the sutures very open; the eyes appear to be natural; but the palpebra of the right was more contracted than that of the left. Venous effusion being suspected, let the head be shaven and blistered.—3d. The patient is apparently sinking; was restless, and moaned much during the night. The eyes slightly affected with convulsive twitches; he moves the left hand little, and it is turned inward, apparently from an affection of the muscles. The right eye is much deeper sunk in the head than the left, and seems likewise to be much smaller than the other. During the night his breast heaved much; he was greatly oppressed; and about eight o'clock in the morning he expired.

N.B.—The state of the pulse could not be accurately ascertained.

Dissection.—In dividing the scalp preparatory to making a section of the cranium, the bones of the head were found to be imperfectly united at the sutures, and the anterior fontanel was large, and its integuments flaccid. The bones could not be removed in connection with each other, and the brain suffered in its organic texture with the attempts which were made to remove them, while a considerable quantity of water escaped from the surface of both hemispheres. Between the *tunica arachnoidea* and *pia mater*, there was a layer of coagulable lymph, of purulent appearance, and in some parts more than one-eighth of an inch in thickness. The veins exhibited much of the same appearance, and in many places their contents seemed to consist as much or even more of this same purulent lymph as of blood. The brain was soft and very vascular, and the ventricles contained water, though the precise quantity could not be accurately estimated. The lymphatic effusion extended along the base of the brain, and encircled the commencement of the spinal chord. From the softened state of the brain, and the injury it had sustained in preparing for examination, much minuteness could not be observed.

In the abdomen, the intestines were blanched, and much distended with flatus. The liver, spleen, and kidneys were in a sound state, but the mesenteric glands were slightly swollen, indicative of incipient disease. In the depending portion of the large curvature of the stomach, there was an opening, apparently more than an inch in diameter. On raising the stomach, some ounces, perhaps three or four, of a dark coffee-coloured fluid escaped through the aperture, the edges of which had a dark shade, and the coats of the stomach were thinner and softened to a considerable extent, and the internal coat was so completely dissolved, that it could be rubbed off with the finger like mucus. The pylorus was very much contracted, and somewhat thickened.

In the chest, the lungs were in a sound state, except that the bronchial glands were enlarged, and about the size of a scarlet bean. The thymus gland was, I apprehend, of the natural size, and might weigh two drachms, and no fluid could be expressed from the incisions which were made into its substance. The right and left auricles were distended with coagulated blood, and the *foramen ovale* open, and the aperture nearly as large as the caliber of the descending *cava*. The left ventricle was very small, but its walls thick and fleshy. Before the state of the *foramen ovale* was discovered, the heart had been removed from the body, which, with hurry connected with a protracted dissection, prevented me from ascertaining the condition of the *ductus arteriosus*.

Kilmarnock, January 1827.

§. II.—MORBID CHANGES IN THE INTERNAL MEMBRANES.

5. *Case of Hemorrhage from the Cerebral Membranes, the Pia Mater, and Choroid Plexus, causing symptoms of Apoplexy.* By Dr JOHN SCOTT, F. R. C. Surgeons, Edinburgh.

ABOUT five in the evening of the 24th December 1834, I was requested to see Mr W. Brown, aged 19, of pale complexion, dark hair, and nervous temperament. About half an hour previously, he had been suddenly seized with a feeling of faintness and sickness, followed by insensibility, which continued only for a moment when he recovered, and vomited a small quantity of watery fluid. He had over-exerted himself the day before, and dined from home. When I saw him he was sick and retching; he complained of severe pain in the fore-part of the head; the skin was cold and pale; the pulse very small, quick, and feeble. External warmth was applied, and an emetic ordered. Two hours afterwards the emetic had operated well; the circulation was re-established; he felt well, but there was still some pain in the head, with foul tongue. Laxative medicines were ordered. Next morning the pain in the head continued, but not severe, and only felt on motion or sitting up. Countenance natural; tongue foul; evacuations scanty and bilious. Laxative medicines continued; and leeches applied to the head.

The attack was considered and treated as influenza, and in eight days he was perfectly well. The only thing that struck me was the persistence of the pain in the head, after the bowels had been freely relieved, on motion or sitting up; but even this had disappeared by the fifth day. The pulse was about 64, full and regular. He continued well till the last week in February, when he went on a visit to Inverkeithing. There he had another attack of the same kind. Insensibility for a moment, followed in half an hour by sickness and vomiting. Dr Dewar of Dunfermline saw him, and prescribed some laxative medicine, and in a few days he was quite recovered.

A week afterwards he had another attack, was insensible for a moment, followed by sickness and vomiting. On these occasions he was always very pale, without convulsions, with a very small feeble pulse. When Dr Dewar saw him at this time he was struck with a labouring appearance in the action of the heart. It was seen and felt to pulsate over a surface unusually extensive, and there was a feeling of undulation in its beat. The pulse was never quite regular for a minute together, and varied in strength and frequency, and in the distinctness of its beat. He complained of a pain in the head, giddiness, and an inclination to faint on raising himself to the erect posture. Dr Dewar opened a vein, but the blood only trickled from the orifice, and with difficulty twelve ounces were obtained, when faintness came on, and it was some time before the circulation could be restored.

I saw him two days afterwards with Dr Dewar. The appearance was natural; but the pulse was 98, small, and rather irregular. He complained of his head on motion, but it was quite easy when lying quiet. The sound of the heart was natural; but the impulse was diffused, and without the regular stroke of the apex. Leeches were applied to the head; and in two days he was quite well again, except that the pulse continued at times irregular. He returned to Edinburgh, and, on his arrival, made no complaint except of weakness. I examined the heart carefully, and satisfied myself there was no disease there. His diet was regulated, and he was advised to be very cautious in every way not to over-exert or fatigue himself.

On Sunday, the 30th March, he had taken a short walk, and returned home about five, when he complained of sickness, and lay down. About seven in the evening he was seized with what appeared to be an attack of epilepsy, viz. violent convulsive motion and twisting of the features, neck, and upper part of the body; great rigidity of the arms; while the pulse was small, and so quick, as scarcely to be counted. He continued in this state about half an hour, and then became sensible, and complained of severe pain on a particular spot in the right temple. He became very sick, and vomited a considerable quantity of fluid. Leeches were ordered, and directions given for the night, as he appeared to have recovered.

About ten he was seized with violent convulsions, and lay in a state of complete insensibility, with rigidity of the arms, full and bounding pulse, and distended veins. I opened a vein, and took a large quantity of blood, which flowed with great force. The convulsions then ceased. Injections were used, and in about an hour, as the pulse continued strong, eight ounces more of blood, which was of a bright scarlet colour, were taken. The pupil of the right eye was observed to be dilated, and of an oval form; the left contracted to a point. A few minutes before death it also dilated. The pulse continued full and strong, but the respiration became gradually embarrassed and slower. When the respiration was ten in the minute the pulse was 98. Ten minutes afterwards, the respirations were five, pulse 90. In a few minutes the breathing ceased, but the pulse could be felt distinctly for nearly a minute afterwards, when it stopped abruptly, and at once.

Dissection.—Very little blood flowed during the removal of the integuments of the head.

On taking off the skull-cap, there was found towards the top of the forehead a bony eminence on the inner plate, projecting inwards about a quarter of an inch, and a corresponding depression was observed in the membranes and substance of the left hemisphere of the brain. The veins leading into the longitudinal sinus contained a considerable quantity of blood; and a slight serous effusion between the arachnoid membrane and *pia mater* was perceptible.

On separating the hemispheres from one another, a remarkable redness appeared diffused over the surface by which they join, and probably caused by the contact of a small quantity of blood proceeding from below. The upper side of the *corpus callosum* was covered with a thin layer of coagulated blood, and this layer of *coagulum* extended backwards and downwards to the base of the brain, the whole of the central part of which, as well as the *pons Varolii*, and the lower surface of the lateral cerebellic lobes, and part of the *medulla oblongata*, as far as the lowest origins of the eighth pair of nerves, were obscured by a thin coagulum of blood.

The lateral ventricles were distended by clotted blood, mixed with a considerable quantity of thin red fluid, which might be the serum. The quantity of blood effused in the ventricles might amount to about three ounces; the clots being in much greatest quantity in the right ventricle, the fluid most in the left. The clots extended into the anterior and middle, as well as into the posterior *cornua* of the ventricles. The middle on the right side contained the greatest quantity, and at the base of the brain the clot seemed to be joined with that effused on the base.

The *septum lucidum* had been broken down. The third ventricle was filled with blood; and a small chord-like clot extended from this through the iter into the fourth ventricle. A considerable quantity of blood was collected between the anterior lobes of the cerebral hemispheres, which separated one or two convolutions on each side from one another to the depth of an inch or more; and we found that the brain was quite broken down and softened in the space of more than half an inch cubic, situated immediately before the *corpora striata*, or the anterior descending pillars of the *fornix*, and above the origins of the olfactory nerves. There was no appearance of disease in the blood-vessels of the brain.

The heart appeared sound.

The left lung adhered by old lymph to the parietes of the chest at the upper part.

6. *Case of Hemorrhage into the Ventricles of the Brain, and into the Theca of the Chord.* By William Brown, Esq. F. R. C. Surgeons, Edinburgh.

Hugh Anderson, aged 9. During the night of 18th May 1829 he awoke, complaining of his head. He then had something resembling a slight convulsion, and vomited freely. When I saw him next day he complained still of his head, and vomited occasionally. His bowels were bound. Cold was applied to the head, some blood was taken away by leeches, and a purgative was administered. On the 25th he was almost well; but in the afternoon he had a convulsion. When seen in the evening he complained much of his forehead, and his pulse was 64. 28th. He had been keeping easier under the use of cold, purgatives, and a blister; but his pulse continued slow, he had a tendency to drowsiness, and his bowels were obstinate. This morning he had first a slight convulsion, and soon after a very violent one, which lasted without intermission for several hours. During this the left arm and leg were in constant motion, the right side only occasionally so. His countenance exhibited an appearance of satisfaction, and he was constantly performing the actions of chewing, sucking, and licking his lips. After the violent motions ceased, the fingers continued to be twitched for some time. In the evening his sensibility returned to a considerable degree: his pulse was then 130. During the last day of his life coma became more profound, diarrhœa supervened, and at length, after several hours of convulsions, he died on the 3d of June.

On dissection the *dura mater* and *pia mater* exhibited a healthy appearance. The lateral ventricles contained each a coagulum of blood, and were distended with reddish serum. Coagulated blood was contained in all the other cavities, was spread in considerable quantity on the base of the cranium, and distended the theca of the spinal chord till nearly its termination. The structure of the brain and chord seemed to be sound.

7. *Case of Hydrocephalus.* By Charles Ransford, M. D.

I was sent for, October 4, 1833, to visit Margaret May, aged 18 months, whom I found in a comatose state, lying sunk in the bed upon the back. Her face appeared swollen, and unnaturally pale; slight convulsive twitches about the angles of the mouth; and deglutition was performed with difficulty. There was complete paralysis of the right arm and leg. The pupils were considerably dilated, but contracted when a lighted candle was put near to them; no strabismus. Respiration was hurried and laborious; pulse 125; skin hot and dry; no vomiting; bowels had been confined for two days previously; the abdomen was not swollen, and had a perfectly natural feeling; the legs and feet were œdematous; urine secreted in small quantities.

I learned that she had been ill for a fortnight,—had been first seized with headach and general uneasiness, manifesting much irritability,—and the day previous to the one on which I first saw her she became insensible. She had always a heavy appearance, but never suffered from worms or any complaint, except occasionally constipation; but I understood that in September she had fallen upon the ground from a chair, and sustained a severe blow upon the back of the head; not complaining of this, however, longer than the day following the accident, no traces of the injury remained. Cold was applied to the head; a blister to the nape of the neck; and two leeches to the temples.

A grain of powder of foxglove, one grain of powder of ipecacuan, with eight grains of calomel, were divided into eight powders, of which one was ordered to be given every six hours. An enema of gruel, containing a drachm of oil of turpentine and castor oil, with the warm bath in the evening. The gums of the left molar teeth, which were swollen, were divided by the lancet. The following day the leeches had bled well; the blister had risen; and was ordered to be dressed with mercurial ointment,—ʒ i. of which was also ordered to be rubbed on the thigh every six hours. No evacuation from the bowels; the powder had been taken regularly; and secretion of urine much augmented. Enema ordered to be repeated.

October 7th. The blistered surface was much inflamed; the bowels had been freely opened; and deglutition was easier.

October 9th. The child appeared much better; pupils contracting more freely; and the state of coma less complete. The calomel was now relinquished on account of diarrhœa supervening. A relapse took place within a few hours, accompanied with convulsive shrieks.

She died on the morning of the 11th.

Inspection thirty-six hours after death.—The body was much emaciated. There were considerable adhesion between the *dura mater* and *calvarium*; the brain was large and soft; both it and its membranes were more vascular than usual; the ventricles were much distended, and contained each about two ounces of serum, clear, and without flakes. In the centre of the right anterior lobe of the brain, a small portion was of the consistence of cream, perfectly white. There were about two ounces of serum at the base, where the arachnoid was considerably thickened, of white opaque colour; a gelatinous deposit extended over the *pons Varolii* and origin of the nerves.

The abdominal viscera were healthy. The lower end of the ileum, for the space of about three inches, was filled with much dark greenish-coloured matter, similar in colour and consistence to the contents of the gall-bladder.

§. III.—MORBID CHANGES IN THE BLOOD-VESSELS.

8. *Case of fatal Apoplexy, with unusual symptoms connected with Disease of the Arteries of the Brain.* By the late Dr JAMES C. GREGORY.

Udny Marshall, aged 49, a stout, active, healthy-looking man, had been in the army for many years, and had been affected with yellow fever and dysentery in the West Indies. But since that time he had enjoyed good health for many years, with the exception of occasional dyspeptic symptoms and headach, so slight as not to interfere with his duties as porter to the Royal Infirmary.

Early in May 1831, he consulted me on account of a dull pain indistinctly referred to the *epigastrium* and the lower part of the *sternum*, and somewhat increased on full inspiration. I examined him particularly at this time. He had no cough, and no signs of an affection of the lungs or heart could be detected by auscultation. The apex of the heart was felt pulsating between the fifth and sixth ribs. There was no increased impulse, and the sounds accompanying its contractions were natural. But in addition to the ordinary dyspeptic symptoms to which he was subject, his tongue was white, his bowels confined, and his appetite impaired. His pulse was soft, rather frequent, and occasionally slightly irregular. Under the use of purgatives and stomachics, the pain, which had never been so severe as to interfere with the active duties of his situation, and the other symptoms, disappeared in a few days, and his pulse became quite regular and of natural frequency. He continued in apparent good health till the 27th of June, when he appeared to be seized with a febrile attack. He complained to one of the physicians' clerks of headach, general uneasiness, and restlessness. His tongue was foul, his skin hot, and his pulse frequent. These symptoms increased towards evening, and continued during the night.

About nine o'clock on the morning of the 28th, he suddenly complained, while in bed, of impending suffocation, with a sense of constriction at the lower part of the neck, and pain referred to the upper part of the sternum. His countenance was anxious; his face pale and clammy; his respiration rather slow and prolonged; his pulse frequent, small, feeble, and irregular. The pain and difficulty of breathing were somewhat relieved by an ether draught, but in a few minutes, and while at stool, he began to complain first of numbness of his right hand, then of vertigo and general feebleness, and this was quickly followed by difficulty of articulation, which terminated in complete *aphonia* before he could be removed to bed. He did not become insensible, and made frequent attempts to speak, and to express himself by signs.

Twenty ounces of blood were drawn from the arm, and before the arm was tied up, he was able to articulate a few words. While the blood was flowing the pulse became less frequent, and stronger, but was still irregular. The action of the heart, which previously could scarcely be detected by the ear applied to the chest, became more distinct, but without increased impulse or sound. He expressed himself relieved, and breathed with greater freedom. But he appeared drowsy, confused, and complained of headach. Twenty leeches were applied to the forehead, which bled well.

When I saw him about twelve o'clock, along with Dr Alison, he was in a state of stupor, approaching to coma, with restlessness, and occasional indistinct and apparently incoherent muttering. His pupils appeared somewhat contracted, but were not insensible to light. His face was not flushed, and his skin was then cool. His pulse was rather small, soft, and occasionally irregular. There was no strong action of the heart, or of any of the arteries. The chest sounded well on percussion, and the sound of respiration was every where natural. There was some distension of the abdomen, with considerable tenderness about the *epigastrium*. He could be roused so far as to put out his tongue when desired, and to answer a few questions. But he was very confused, his articulation seemed impeded, and when left to himself he quickly relapsed into incoherence. The tenderness at the *epigastrium* disappeared after the application of some leeches, and, under the use of purgatives and other remedies, the symptoms of an affection of the head abated considerably. The drowsiness and stupor went off in a great measure. He was able, though not very accurately, to describe his sensations. His articulation became much more distinct, and he had no numbness or loss of power in any of his limbs. But there was still something peculiar in his mode of respiration, particularly during expiration; and when speaking, it was hurried, anxious, and somewhat interrupted. He could take a full inspiration without apparent pain, but when questioned on the subject, he always said, "there was something not right there," without pointing to any particular part as the seat of uneasiness. His pulse at this time had become much more regular, but was more frequent than before. It was soft and small in the right arm, but was of better strength in the left.

The symptoms now, for a few days, resembled very much those of our common continued fever, and even put on somewhat of a typhoid character. His tongue, at first white and foul, afterwards became dry, with thirst; his skin was hot, and his face somewhat flushed. He had some headach; was restless, with moaning and occasional muttering delirium, especially at night. His countenance was languid and oppressed, and his pupils somewhat contracted. At this stage of the disease, the state of the pulse, as well as the other symptoms, indicated the use of wine. A little was accordingly given for two days; and under it the pulse improved in strength, and became less frequent. But on the 4th of July the drowsiness and stupor returned; and, notwithstanding the application of a blister to the head and active purging, gradually passed into complete coma, with slow pulse and stertorous breathing, and he died on the evening of the 6th of July.

Inspection.—The body was examined about forty hours after death. It had unfortunately been kept during hot weather in a warm room, and the process of decomposition had already advanced rapidly. The whole cellular membrane was extensively emphysematous and swollen. The face was so livid and swollen that the features could not be recognized. The most of the abdominal and thoracic organs exhibited a darker and more livid colour than common, evidently the effect of decomposition, perhaps increased by the blood being everywhere fluid.

The heart was of natural size, soft, and flabby. There was no hypertrophy of any of the cavities. The walls of the right ventricle appeared even thinner than usual. The internal surface of all the cavities, as well as of the aorta, its branches, and the pulmonary artery, was of a deep-red colour, apparently caused by imbibition of the fluid blood. When cut into, the muscular substance of the ventricles was very soft, of a paler colour than natural, and of a mottled and somewhat granular appearance, as if from the internal deposition of fatty matter. There was perhaps a very slight commencement of thickening at the base of the aortic valves, but certainly not so much as to have interfered materially with the action of the valves, which were otherwise quite healthy. The mitral, the tricuspid, and the semilunar valves at the mouth of the pulmonary artery, were quite healthy.

No disease could be detected in any of the abdominal organs.

The brain, contrary to expectation, was found remarkably fresh and firm in its texture. There were no unusual signs of sanguineous congestion on its surface or in its substance, and the ventricles did not contain more than two drachms of limpid fluid. But on removing the brain, the whole of the arteries at its base, the vertebrals, the basilar, and the internal carotids, were found extensively diseased. This change of structure, which appeared to be chiefly confined to the inner coats, was most marked in the large trunks, but it extended also into the minute branches in every part of the brain. These branches seemed to be everywhere enlarged and thickened; and, on making sections of the *corpora striata*, numerous openings, which would admit the head of a common-sized pin, were seen; and from these portions of the blood-vessels could be drawn out by means of the forceps, in which the same change of structure could be distinctly traced. This disease consisted chiefly in a firm and opaque deposit, generally of cartilaginous, but in some spots of bony, consistence, irregularly distributed on the inner coat of the arteries, adhering firmly, and causing loss of elasticity and transparency. In several places, even in the larger trunks, where this deposit was most abundant, the area of the artery was completely plugged up by concretions of the fibrin of the blood. In those places where this decided change of structure had not taken place, the internal membrane appeared thickened, and had a red colour similar to that described in the heart and great vessels. The greatest amount of this disease appeared to be in the basilar artery and its branches, where it lies in contact with the *tuber annulare* and the *medulla*, and in the arterial circle of Willis. It was traced in the internal carotid within its bony canal; and, in order to ascertain how far it extended into the larger arteries, the common carotids were examined along their course as high as their bifurcations. Just below this point a distinct *corona* of disease, with some ulceration of the inner coat, was found in the left carotid, and a similar but less marked appearance in the right.

9. *Case of Apoplexy in consequence of Effusion of Blood from Aneurism and Rupture of the middle Meningeal Artery.* By Dr John Gairdner, F.R.C. Surgeons, Edinburgh.

On Friday the 2d December 1814, I was desired to see the subject of this case, a tradesman, 48 years of age. About three weeks before he had assisted a neighbour to carry a heavy load to the top of one of the high stairs in the old town. In doing so he felt a sudden headach, and he was troubled from that time forward with headach and occasional giddiness, increased by stooping forward. For some days before I was called, he had also been conscious of some degree of imperfection of vision. At the time of my visit he represented his headach to be very violent and severe. The pulse was 46, feeble and oppressed; the pupils of the eyes contracted and dilated readily enough, but two days after (Wednesday 7th) they were found to be permanently contracted, and not affected by the admission or exclusion of light, and they continued in this state ever afterwards.

Next day (Thursday) he was in a drowsy state, but he could easily be roused from it. He replied to questions distinctly enough, and seemed to have less suffering. There was obviously a failure of his muscular power, for he sunk down in bed and was unable to raise himself. After this he proceeded by imperceptible gradations to a state of perfect coma, with absolute insensibility to light and sound, and impressions of all sorts. Involuntary discharge of his feces and urine occurred for several days prior to his death, which happened on Tuesday the 13th. It is worthy of remark, that the breathing was without stertor even to the last.

Dissection.—On opening the head a sac was found on the left side, in the course of the meningeal artery, occupying the region of the lower part of the parietal, and upper part of the temporal bone, formed by the separation of the layers of the *dura mater*, and containing about four ounces of blood in a state of coagulation. The portions of the *dura mater* forming the walls of this sac were much thickened and very vascular. The surface of the brain opposed to the sac was flattened, or rather depressed, and the ventricles contained a considerable quantity of serous fluid. These were the only morbid appearances. It is obvious that the artery which poured out the blood must have given way a month before, at the time when he lifted the heavy load and experienced the sudden headach.

§. IV.—MORBID CHANGES IN THE BRAIN.

10. *Loss of Cerebral Substance in an old Apoplectic Case.* By DR ABERCROMBIE.

A gentleman, aged 64, was first seized with apoplexy in 1824. He recovered under the usual treatment, but retained some imperfection of speech, and a degree of weakness of the left side. Some months after, he had a second attack; and in July 1825, a third, accompanied by convulsion. In this attack he lay in a state of insensibility for thirty-six hours, and was not able to leave his room for a fortnight. From this time to the period of his death in 1830 he had a succession of apoplectic attacks, amounting in all to twelve. Each left him more and more embarrassed in his speech, and paralytic on the left side, with distortion of the mouth; and he died in the twelfth attack in 1830, after an illness of eight or ten days, during which he lay in a state of nearly perfect coma, with total loss of speech, and perfect palsy of the left side.

Inspection.—On removing the *dura mater*, a remarkable depression was observed on the surface of the right hemisphere, forming a deep and well-defined cavity, capable of containing from three to four ounces of fluid. It had been filled by a clear serous fluid, which escaped when the *dura mater* was wounded in opening the head. The surface of the cavity presented nothing different from the usual appearance of the cerebral surface, being covered by the *pia mater* and arachnoid; but the *dura mater* was extended across the mouth of it, and had inclosed the fluid by which the cavity was filled.

On cutting into the cerebral substance which bounded this cavity, it was found more dense than natural; and immediately below the bottom of it, in the substance of the hemisphere, a cavity was exposed, presenting the usual appearance of a collapsed apoplectic cyst, which had been the seat of an extravasation. It was about an inch and a-half long, lined, as usual, by a yellowish membrane, and part of it was obliterated by the adhesion of its opposite surfaces, a thick layer of the same kind of membrane being interposed between the surfaces of cerebral matter at the place of adhesion. Several other very small cysts were observed in various parts of the right hemisphere, but they were all empty; and no appearance could be discovered capable of accounting for the fatal attack.

The leading peculiarity of this case is the remarkable cavity on the surface of the brain, produced by actual loss of cerebral substance at the part which covered the apoplectic cyst. It presents another fact of some importance,—namely, the most distinct approach that I have seen towards an obliteration of the cyst by the adhesion of its opposite surfaces. The French writers describe the cysts as being entirely obliterated in this manner. I was formerly disposed to doubt the accuracy of these observations; but in this case about one-half of the cyst was obliterated, and there did not appear any thing to prevent the obliteration of the remainder.

11. *Case of Tumour in the Left Hemisphere of the Brain producing Epilepsy with Paralysis.* By JOHN GAIRDNER, M.D. Fellow and former President of the Royal College of Surgeons, Edinburgh.

The subject of this case was a most laborious tradesman, of strictly temperate habits, and of more intelligence and information on most subjects than are usually found among persons in his station in life. He was seized (the 16th March 1826) with epilepsy, together with partial paralysis of the right foot, and a slighter affection of the same sort in the hand of the same side. Previously to this, he had been tolerably healthy, with the exception of a scrofulous swelling above the left clavicle, for which I attended him some years before, and which, after disabling him for a long time, slowly suppurated, and ultimately got well. On the supervention of the epilepsy he was freely bled and purged, and subjected to a strict regimen. The fits afterwards continued to recur at various intervals. They became aggravated in the summer, and attended with pain of the head, loss of speech, great increase of the palsy of the arm, together with startings of that arm, which went on almost unceasingly. The fingers of the hand became spasmodically contracted, and continued all the rest of his life indented into the palm, from whence they were occasionally with great difficulty drawn out for the purpose of paring the nails. The power of speech, after leaving him entirely, returned partially, and underwent several variations in degree in the course of his illness. But after it first quitted him, he now regained it sufficiently to be able to utter more than two or three words consecutively. He would often make an attempt to communicate his thoughts, and after beginning a sentence, would stop suddenly, as if either from failure of his memory, or from inability to articulate the word he wished to employ. His sight was good; he knew every one at once, and continued to take an interest in many things; but his memory was very imperfect; and, although formerly a great reader on all subjects, he lost all interest in books, from inability to make the mental effort necessary to carry on the train of ideas suggested by them. The pain of the head was a pretty constant symptom during the last twenty months of his life; sometimes, and especially in sultry weather, it was very distressing. It was situate in the left parietal region. It was sometimes alleviated by cupping on the spot; but now entirely banished. Blisters, and various other means, local and general, were also employed without any permanent benefit. The disease progressively increased, and destroyed his recollection so completely, that he latterly did not recognize his most intimate friends. He died the 30th March 1828, after having been ill more than two years.

Dissection.—On the left side of the head, the *dura mater* adhered to the surface of the arachnoid and *pia mater* throughout the whole region of the parietal bone, part of the frontal next to the coronal suture, the greater part of the temporal and left *ala major* of the sphenoidal bone. Subjacent to these adherent membranes, and anterior to the course of the middle meningeal artery, there was a tubercular tumour, or rather what had the appearance of a congeries of tumours coalesced into one mass, which extended from midway between the antero-superior and antero-inferior angles of the parietal bone above to the *sella turcica* below, including the whole surface of the left middle lobe of the *cerebrum*.

This disease did not penetrate deeper into the brain than the convolutions. Its colour, when stripped of the investing membranes, was yellow, like that of pus; its consistence firm superiorly, but much softer as it proceeded downwards, and semifluid in the situation of the middle lobe.

The ventricles were distended with serum, and much of the same fluid was effused between the membranes of the brain on all its aspects. In other respects the *cerebrum* and *cerebellum* were natural.

12. *Case of Hypertrophy of the Brain, with Spontaneaus Obstruction of the Humeral Artery, and other morbid changes.*

By Dr CHRISTISON.

A woman Johnston, of dissipated habits, and 37 years of age, was admitted into the Infirmary of this place, affected, as was alleged, with palsy. Her friends could not give any account of her illness, farther than that she had been suddenly taken ill fourteen days previously with weakness in the limbs, and that in eight days she began to complain of severe headach and to lose her memory.

When I first saw her the sensibility was generally impaired; yet she expressed pain, in whatever part of the body the skin was pinched. She could move both legs and the left arm with tolerable freedom; but the right arm was quite flaccid when moved by another person; and although she could move it when desired, she did so feebly, and could not direct the hand to a given object, which she could do well enough with the left. There appeared also to be an imperfect paralysis of the muscles of the face. When she spoke the left side only of the mouth moved, and when she was pinched on the trunk or extremities the left corner alone of the mouth was retracted. Yet when the *right* cheek was pinched, she then retracted both sides. The eyelids on both sides were unaffected. The tongue was thrust out straight, when she was told to show it. The pulse was above 100, moderately full and rather hard. The breathing was slow and soft.

There was obviously considerable stupor. She had a tendency to doze, did not always understand even simple questions, and her words were broken and incorrectly connected, though it was evident she sometimes understood sufficiently what was said to her, and what she ought to say. The pupils were dilated, but contractile.

In the right arm the pulsation of the artery ceased abruptly about two inches below the level of the outer edge of the *pectoralis major*, and could not be felt any where lower down. This arm was also very cold, while the rest of the body was at least of natural warmth.

I immediately directed that she should be bled; but she fainted when scarcely four ounces of blood were withdrawn.

She was bled from the *left* arm. A brisk cathartic was then administered, and also a purgative injection.

On the second morning the right arm was completely paralyzed; but the left arm and both legs continued sensible, and likewise retained freedom of motion. The general sensibility and her articulation were unaltered. The bowels had not been moved. The pupils were less dilated. The pulse in both wrists and ankles was no longer perceptible; and at the temple it was 80, and very feeble. She still thrust out her tongue when desired to show it. On examining the heart with the stethoscope, it was found that neither impulse nor sound was produced at the ordinary period of the heart's pulsation; but instead of them there was a very distinct and prolonged *bruit de soufflet.*

She was much inclined to doze in the morning; afterwards the somnolency gradually increased till complete coma was established; and in the evening she died.

The body was examined in forty-two hours. In the chest, the lungs were found gorged here and there with blood towards their posterior surface. The heart and arterial system appeared unusually small for a woman above the middle stature, as she was. The valves of the heart were healthy, with the exception of the mitral,—one division of which was nearly separated from the parietes of the heart by a fissure; and both edges of this fissure were covered by crumbly, cauliflower-like excrescences. The inner coat of the aorta was here and there opaque and inelastic.

In the region of the right arm, corresponding with the point where the pulsation of the humeral artery ceased, a considerable swelling of the artery was perceived; and about two inches below the upper edge of the swelling, the artery abruptly diminished to less than half its natural breadth. On laying open the vessel in the situation of the swelling, it was found that immediately below the going off of the *profunda humeri*, the whole circumference of the inner coat was detached along half an inch of the course of the vessel, and hung loose in the cavity in the form of a cone; that this cone, of course pointing downwards, was filled with white, firm fibrin, to the upper part of which was attached a bloody clot an inch long, and adhering to the undisturbed part of the inner coat. Below the cone the tube of the vessel contained another looser and unattached clot; and between the cone and the stripped fibrous coat purulent-like matter was deposited.

In the head we found the whole surface of the brain uncommonly dry, both on its upper region, and likewise at the base. There was no fluid whatever between the *dura mater* and arachnoid, or in the base of the skull; neither was there any effusion in the arachnoid itself. The convolutions of the brain were flattened in a considerable manner, and the vessels in their grooves, though they contained a good deal of blood, were manifestly compressed. The whole substance of the brain was rather firmer than usual, except at the posterior part of the posterior lobes on each side, where the cortical substance was softer than elsewhere. The cortical structure had everywhere its natural colour. Throughout the whole substance of the brain very few bloody spots were presented when it was sliced. The right ventricle contained less than a teaspoonful of fluid, and the left a few drops only. In the posterior angle of the left *corpus striatum* there was a spot as big as a sixpence, where the tissue of the brain was reddish and softened to the consistence of a thick pulp. No other disease could be found in any part of the brain, except two minute tubercular bodies of the size of half a lupin-seed, in the external cortical matter of the left middle lobe. The cerebellum was healthy in colour and firmness, and its convolutions not flattened.

I have presented the preceding case to the Society as being, so far as I am aware, the first that has hitherto been noticed in this country of the remarkable disease described about the same time by *M. Dance* and *M. Laennec (neveu)* under the name of Hypertrophy of the Brain. In the original papers of these gentlemen, of which a copious abstract has been given in the Edinburgh Medical Journal, Vol. xxxii. p. 225, several instances are related where the signs of what they consider hypertrophy were present without any other diseased appearance whatever,—namely, want of the ordinary cerebral fluid, flattening of the convolutions, unusual firmness of the substance of the brain, and diminished vascularity of the brain and its membranes. In the present case these signs existed along with partial *rammollissement* of one *corpus striatum*,—which concurrence of pathological appearances was also remarked in some of the French cases. When the description I have endeavoured to give of the state of the brain and its membranes in my patient is carefully attended to, I think it will appear scarcely possible to ascribe so much external flattening of the convolutions, dryness of the membranes, and firmness of the cerebral tissue to any other cause than hypertrophy. It cannot be reasonably referred to the *rammollissement* in the *corpus striatum* producing distension of the surrounding cerebral matter; because flattening of the convolutions in connection with this disease is observed only when the *rammollissement* is very extensive, and even then not always.

June 7, 1831.

§. V.—MORBID CHANGES IN THE CEREBELLUM.

13. *Periodical Headach terminating by Effusion of Serum into the Ventricles of the Brain,—Tumour in the Cerebellum.* By JOSIAH ALLSOP, Esq. Birmingham. Communicated by DR ABERCROMBIE.

James Scott, æt. 6, began to suffer, in September 1829, from fits of severe sick headach, recurring at first about once a fortnight, then increasing in frequency to one or two a-week. For four months he continued to enjoy good health in the intervals. He was stout, fleshy, growing rapidly, good appetite, bowels regular and dejections natural, until a very short time previous to death.

The evening before the paroxysm he was often observed to sigh, and appeared a little restless and languid. The attack usually came on early in the morning, awaking him with severe bursting headach and nausea, increasing for some minutes to excruciating agony, when he called out for his head to be compressed, and vomited. The pupils were large, not obedient to light, but contracting and dilating irregularly, as much in the light as shade. The pulse slow, weak, and irregular. The pain commenced in the forehead, over the left eye, extending from thence to the occiput. The head was occasionally drawn back during the severe pains. The duration of the paroxysm, consisting of these aggravations of pain and sickness, with remissions of varying duration, was from five to twelve hours, terminating in long and calm sleep, from which he awoke lively and free from complaint; the next day he appeared in full health and spirits.

I may here mention, that in this case leeching during every paroxysm, purging, and low diet, were used early in the disease, without having the least influence on the violence or recurrence of the paroxysms. Afterwards small doses of the sulphate of quinine, with the shower-bath, seemed triflingly to moderate their violence. When the inflammatory symptoms appeared, he had leeches and blistering to the neck several times. But the only means which relieved his sufferings in any appreciable degree was an active purgative taken on the commencement of the fit, and the cold affusion during the aggravations of pains.

In February 1830, first appeared symptoms of a more permanent disorder of the circulation in the head. He began to complain of slight intolerance of light. The pupils dilated, and contracting imperfectly; slight wandering pains in various parts of the extremities and trunk, with a slight tenderness at the lower cervical vertebra. These pains in a few day subsided; but the dilatation of the pupil increased with indistinct vision, until he could but just distinguish light. He was now more than a month free from the paroxysms of headach; had tingling of skin; slight dragging of the left side; walking with a jerking motion; head drawn to one side.

13th March. To the previous symptoms were added languor and debility, with a return of the flying pains.—14th. Another and last fit of severe headach occurred, leaving the flying pains more severe. His pulse now became increased in frequency, 104. The spine was tender to pressure throughout the whole length. The languor increased to inability to hold himself erect, and at length to imperfect paralysis of both extremities, greatest on the right side. The bowels became obstinately confined, and the urine at length retained, requiring the use of the catheter. From the 20th to the 22d of March, he had an attack of fever, with intolerance of light and sound,—watchfulness, increase of pain and general tenderness of skin commencing; the frequency of the pulse remained as before. During this heat of skin and increased determination to the head, the eyes, before dilated, now contracted, but again dilated on the cessation of these symptoms, and he remained afterwards incapable of distinguishing light at all. The pulse now rose in frequency to 124; he ceased to complain of pain except when touched or moved.

From the 1st of April he slept much, but was easily roused; made no complaints unless when moved. A puriform secretion came from the eyes; foul parched tongue; difficulty of swallowing; respiration became irregular, ceasing for a time, then beginning again with inspirations of unequal length. He died on the 3d of April, not of suffocation, but apparently of exhaustion, remaining perfectly sensible, and retaining all his intellectual faculties entire to within a few minutes of death.

Examination of the body six hours after death.—Not emaciated. The bones of the head were not separated at the sutures. The *dura mater* was transparent. The veins on the surface of the brain were turgid and minutely injected; no bloody points observed in the white substance of the brain. The gray parts not firmer than usual;* the white extremely dense, especially in the cerebral parts, but of a full white colour. The lateral ventricles, and the parts communicating with them, were greatly distended with transparent serous fluid, and did not collapse in the least when it was removed. The *foramen* of Monro, with smooth round edges, would admit an almond. The plates of the *septum lucidum* were firm, with a ventricle containing fluid between them. The fourth ventricle was distended with fluid. The *thalami* were separated from each other. The *infundibulum*, like a true funnel, contained fluid. The lining membrane of the third ventricle was opaque and thickened, so that it could easily be raised. We were unable to measure the quantity of fluid which escaped from the ventricles; but it certainly could not be less than eight ounces.

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* From the pure whiteness of the colour, I am inclined to attribute much of this hardness to compression. The gray parts were not harder than usual; but in the *corpora striata* they could be scraped away from the white.

On the base of the brain, the optic nerves were soft, yellow, and diminished in size. All the natural depressions filled up with a transparent jelly-like yellowish deposit; between the *pia mater* and opaque arachnoid following the course of the vessels, into the different fissures.

The veins of the *cerebellum* were injected; but no disease found in its substance, except at the posterior and inferior point of each lobe, where a small portion was softened and semitransparent. In this part of the left lobe, which was most affected, was felt a hard substance, which cut like scirrhus, opaque, of a homogeneous appearance, and cream-colour in the centre, of a walnut size and shape, its edge semitransparent, but equally hard as the centre, in which no bands or lines could be traced. The leaflets of the lobe, with their medullary centre and *pia mater*, were not pushed aside by its growth, but involved indiscriminately in its texture.

The membranes of the spine were also distended with transparent fluid. The chord itself had a very natural appearance, but it was firm, although less so than the central parts of the brain.

14. *Epilepsy.—Great Venous Turgescence in the superior parts of the Brain and Cerebellum.* By JOSIAH ALLSOP, Esq. Birmingham.

W. Ward, æt. 13, laboured under epileptic fits two years. The fits recurred at irregular intervals, generally about a week's duration. The convulsion, with loss of consciousness, lasted but for a few minutes, followed by sleep. If he had been attacked in the night-time, he always felt shivering on washing in the morning. They usually left slight giddiness and headach. Stooping much would bring them on. They first came on in the night, after being fatigued making hay, exposed to the sun without his hat, recurred three succeeding nights, and then left him for four months. The cause of their second recurrence was unknown. His perception is dull. There is a heaviness and stupidity in his appearance; but his appetite is good, and bowels quite regular. He is full-grown, stout, and has the appearance of enjoying excellent health. On their first occurrence, bleeding, seton, and antiphlogistic remedies were used without benefit; indeed, depleting treatment seemed to increase their frequency. Afterwards, the nitrate of silver and ammoniuret of copper were persevered in sometime without the least benefit, after an interval of less frequent fits.

April 11th. He had three or four attacks, one coming on before he had recovered from the sleep of the preceding, then a few days' usual health.

15th. He had gone to bed in his usual health, but had several severe fits duirng the night. He had another immediately after a shower-bath in the morning of the 16th; and several in the forenoon; in the intervals he seemed more stupid than usual, but complained only of slight headach; costive.—17th. Only one slight fit; stupid.

18th. Frequent recurrence of slight fits all day. In the night he was insensible, three hours lying supine. The muscles of the face and jaws convulsed.

19th. He had a very severe fit, leaving slight coma and twitching of the face in the place of the usual sleep. The medical attendant was now called for the first time, and eighteen or twenty ounces of blood taken immediately; after which the pulse rose in frequency, with palpitation and a severe convulsion fit, followed by coma and twitching of the face until midnight, when he became restless, shouting out death loudly for sometime. He then relapsed into insensibility, stertorous breathing, twitching of the face, and died on the evening of the 20th.

Examination of the body on the fourth day after death.—The brain was soft, but not more so than usual in individuals of that age. The veins of the superior part of the brain, and of the *cerebellum*, were minutely injected, and extremely turgid with fluid blood. The vessels on the inferior surface were empty. Dark points, larger than I ever found before, studded the white matter of the superior part of the brain; diminishing in the centre, till scarce any or none were found in the white matter of the base. The sections of the *cerebellum* also presented them, but rather thicker on one side than the other. About three teaspoonsful of serum escaped from the whole,—a very minute quantity of which was found beneath the arachnoid. The gray matter was full-coloured, much deeper in the *cerebellum* than in the brain, but contained no bloody points. The veins of the spine were also turgid; but its sections quite natural, and free from bloody points. No other diseased appearances could be found in any part of the *cranium*, or of its contents. The stomach was perfectly natural.

15. *Case of Hydrocephalus, connected with disease of the Cerebellum, in an Adult.* By the late Dr J. C. Gregory. *

Ann Murray, aged 40, had received a blow from a saw on the back of her head, between three and four months before her admission into the Infirmary in November 1830. This blow, according to her account, had been so severe as to render her insensible for about an hour, and from that time she had never been free from headach. At the time of her admission under the care of my colleague, Dr Shortt, the headach was constant, with a sense of weight referred to the occiput, and was much aggravated on motion of the head or body. She had frequent nausea and vomiting, especially on attempting to assume the erect position. She said she had some dimness of sight, but there was no apparent affection of vision, and the pupils contracted readily on exposure to the stimulus of light. There was no palsy,—no affection of the speech or hearing, and her intellectual faculties did not appear to be impaired. Her bowels were very costive; her pulse was about 100, and rather weak; and she had other febrile symptoms, which abated under treatment.

When transferred to my care in the end of November, she was recovering from an attack of erysipelas of the head and face, attended with delirium; and for some time after this she complained much less of headach. Her pulse became nearly natural in frequency, though still small and weak. But frequent nausea and vomiting continued. The headach returned, occurring in severe paroxysms, generally excited by the slightest motion, and at times causing her to scream out. She required the constant use of purgatives, and underwent a variety of treatment without material relief. On one occasion she had a fit of syncope on being raised up and removed from bed, and on another she had a fit of insensibility, which, from description, resembled a slight attack of epilepsy, although there were no convulsive movements of the limbs. She expired suddenly at the hour of visit on the 19th of January, without change on her symptoms, and without convulsions. Her faculties remained entire to the last, and she answered distinctly the questions put to her a few minutes before her death.

Inspection.—On removing the *dura mater*, the surface, as well as the base, of the brain, appeared unusually dry and glistening. No fluid was effused between the arachnoid and *pia mater*. The convolutions were everywhere much flattened and compressed on their surface, so that the *sulci* between them were scarcely perceptible. In making a horizontal section of one hemisphere, not above a quarter of an inch from the surface of the convolutions, a large quantity of limpid fluid gushed out with considerable force, and unfortunately could not be collected. This was found to have proceeded from the lateral ventricles, which were enormously enlarged, and still contained from five to six ounces, by measurement, of limpid serum. A few shreds only remained of the *septum lucidum* and *fornix*, but there was no disorganization or softening of the other parts of the brain. The third and fourth ventricles were also very much enlarged, and filled with serum. On comparing the quantity of fluid collected with the capacity of the four ventricles, it appeared that the whole quantity accumulated in them could not have amounted to less than from ten to twelve ounces. A great part of the left lobe of the cerebellum was in a state of complete gelatinous rammollissement; and a firm dense membrane was found stretching (beneath the arachnoid) from the *cerebellum*, especially on the diseased side, to the posterior part of the *medulla oblongata*, so as apparently to close up that communication, existing in the natural state between the ventricles, the surface of the brain, and the spinal chord, which has been particularly described and commented upon by Magendie. There was no yielding of the sutures of the cranium, which was of ordinary thickness and density. The abdominal organs were healthy.

This case forms a striking contrast with those in which apoplexy, palsy in its various forms, coma, and convulsions, have been caused by an effusion of serum into the ventricles, or on the surface of the brain, taking place apparently very rapidly, but to a small amount in comparison with the quantity which was found in the present instance, and which must have been accumulated very gradually. It appears very probable that the unusual dryness of the whole surface of the brain, and the great accumulation of fluid in the ventricles, was connected with the closing of the communication above-mentioned, by the adventitious membrane.

16. *Tumour of the Cerebellum, with remarkable course of the symptoms.* By Dr Abercrombie.

A gentleman, aged 34, in the year 1825, first began to be affected with occasional attacks of headach, which were usually accompanied by vertigo and dimness of sight. In 1827, the pain became more severe, and was distinctly referred to the occiput and upper part of the neck. He had generally a remission of it through the day, and aggravation in the evening. In the spring of 1828, the symptoms increased in severity, but he received considerable relief from blistering. In the summer he went to the country, where his general health was much improved, and the headach greatly mitigated. He continued in this improved state till May 1829, when the attacks of headach were again aggravated, accompanied by giddiness, and on one occasion he fell from his chair. In October of the same year, he began to be affected with a most distressing sense of throbbing, referred to the back of the head; and he was also annoyed with frequent vomiting, which continued without intermission for three weeks. The paroxysms of headach were now aggravated to an intense degree of severity; they occurred chiefly in the evening, from six o'clock till midnight, but also at other times of the day. During the more severe attacks his face was flushed,—the blood-vessels in the temples were remarkably distended,—and he lay unable to speak, in a state bordering upon total unconsciousness, and with his hands and arms spasmodically contracted. He still had occasional vomiting, and intense acidity of the stomach, —and several times he mentioned double vision. His pulse was generally natural; bowels very obstinate.

His state was now considered as nearly hopeless; and no relief was obtained from any kind of treatment. But after five or six weeks of the most intense suffering, the symptoms gradually remitted, and during several weeks in December and January, he continued almost free from headach,—he was able to walk out, and his general health was greatly improved. In February 1830, the symptoms again increased, but the pain was now chiefly complained of above the eyes. The remissions also were more complete, and, upon the whole, his sufferings were less severe than during the former attack. In March his complaints again subsided; and he was able to take a good deal of exercise in the open air, and even to attend to his business. He had still occasional attacks of headach, but they were not severe, and his condition was considered as much more favourable than it had been for a long time. In the middle of April the paroxysms of headach became more severe, but by no means in the degree in which they had occurred on former occasions. He was not confined, and no degree of apprehension was excited until the 24th, when, in one of the paroxysms, he suddenly expired.

Inspection.—The ventricles of the brain contained from three to four ounces of limpid fluid, but the cerebral substance was entirely healthy. Imbedded in the left lobe of the *cerebellum*, there was a tumour, the shape and size of a very small walnut. Externally it was firm, and presented the usual appearance of the scrofulous tubercle. Internally it was softened, with the usual appearance of unhealthy scrofulous suppuration. The substance of the *cerebellum* around it was entirely healthy. All the other viscera were sound.

It is unnecessary to point out the remarkable features presented by this case,—the extraordinary remissions in the symptoms,—the periodical character of the paroxysms even at the time of their most intense severity,—the long interval of comparative health which preceded the final attack,—and the very sudden nature of the fatal termination,—we may add, the healthy state of the whole cerebral substance, after such protracted suffering.

The patient was a medical man, and his protracted distress excited much interest. He was frequently seen by Dr Thomson and myself; and received the most assiduous attention from Dr Moncrieff and Dr Young.

§. VI.—MORBID CHANGES IN INDIVIDUAL NERVES.

17. *Cases of Paralysis of Individual Nerves of the Face.* By Dr CHRISTISON.

1.—*Palsy of the Third Nerve or Motor oculi—recovery under free venesection, and mercurial salivation.*—A stout blacksmith, of middle age, and much given to drinking, was admitted into the Fever-hospital, supposed to labour under continued fever. During the confusion incident upon opening the hospital and receiving a great number of patients before the appointment of a physician, the exact nature of his case was for some days overlooked. But a day or two after my appointment, my attention was called by Dr W. Reid, then superintendent of the hospital, to a considerable squint of the left eye; upon which the following account was given by the patient.

Three weeks before his admission into the hospital, and immediately after a debauch, he first remarked that he saw double; and at the same time he was affected with ringing in the ears, headach and giddiness, which last symptom was particularly troublesome when he kept his left eye open. After a fortnight he had rigors, general soreness, and increase of headach; and for ten days after admission into the fever-hospital, he had the symptoms of a mild attack of general fever, with continuance of double vision. Subsequently the two images gradually approached one another, till at length they coincided, and he saw single; and at the same time the general fever ceased. When first carefully examined a few days after that, it was observed, that the left eyeball was turned very much outwards; that he had no power whatever to turn it upwards, inwards, or downwards; that when desired to look up he merely rotated the eyeball on its horizontal axis inwards; and that the upper eyelid always hung over the ball, so as to be in contact with the lower, except when he was told to raise it, upon which he uncovered half only of the pupil. The pupils were equal in size and contractile, and when he closed either eye he saw quite well with the other. The vision with both eyes was not double. He had frequent diffuse headach, but no disorder in any other function.

For some days after this examination, the state of the affected eye varied, as he occasionally recovered imperfectly the movements of the eyeball for twenty-four hours at a time. But at length they were lost entirely. The treatment for ten days after the paralytic affection was remarked consisted in the occasional application of leeches to the temple, and of a blister issue behind the ears, together with frequent laxatives. No amendment, however, was procured from these measures.

Four or five days later, when he had been three weeks in the hospital, his headach began gradually to increase, and the pulse to rise; in a day or two more he complained of great general soreness of the head, and of shooting pains, numbness and diminution of muscular power in both limbs. Blood was therefore drawn from the arm to the amount of two pounds. It was very buffy, and gave immediate relief from the headach. Calomel was also prescribed in the dose of five grains four times a-day, with a little opium, for the purpose of quickly affecting the mouth. When this had been continued four days, the affection of the limbs ceased, and the fever abated considerably; but a slight deviation was remarked in the tongue to the left, and in the mouth towards the right side, while at the same time the affected eye was turned more outwards than ever. On the sixth day of the mercurial treatment his gums became tender; and the calomel was therefore discontinued. A moderate salivation immediately followed. On the fourth day after the discontinuance of the calomel, there was an obvious improvement in the state of the eye, and in twenty-four hours more the improvement was considerable. The movements of elevation, depression, and adduction of the eyeball, could be performed to half the natural extent, and he could raise the eyelid so as to uncover two-thirds of the cornea. At the same time the deviation of the tongue and mouth, the headach, and all his other complaints ceased.

From this time he improved rapidly and steadily, so that in a week after the lost movements recommenced they could be performed perfectly. The salivation lasted twelve days, and was always gentle. In twelve days more he was dismissed quite well, having been in the hospital seven weeks.

It is worthy of remark, that after the movements of the affected eye returned so completely, that this eye, when the other was covered, could follow a moving object briskly in any direction, some days more elapsed before the affected eye accompanied the other in its movements, when both were uncovered. For example, if the patient was directed to look at an object straight before him, he squinted the left eye outwards, and looked at it with the right only; but if he was told to look at it while the right was covered, he turned the left on it; and when the right was then uncovered, he directed both eyes on the object, and for a few seconds followed it with both, when it was moved before him.

I shall not attempt to explain the singular fact mentioned at the commencement of the case, as to the man first seeing double, and then remarking a gradual approximation of the two figures till they coalesced, and he saw single,—while the squinting of the eye nevertheless continued. This is so different a phenomenon from what we should expect in the circumstances, that I shall not insist on the accuracy of the statement, because it was drawn up from the man's own account of what occurred some days before I saw him. Yet it is fair to add, that he always gave a very clear narrative of the progress of his illness, and never deviated in any particular from his first statements. In such a case, we should expect—not that the images would gradually approach and coalesce,—but simply that the individual would gradually acquire the habit of abstracting his attention from one of the images, and so recover single vision.

2. *Palsy of the Portio Dura of the Seventh Nerve on both sides.*—A young man of middle stature was admitted into the Fever-hospital on account of a smart attack of continued fever of the inflammatory type, but without any particular local inflammation. On the fourteenth day of the disease he got quickly better by critical sweating, the pulse falling from 120 to 72 in the course of a single night. Nothing occurred to interrupt convalescence till the end of the fourth week, when he complained of a sore mouth, for which a vinegar wash was ordered. In five days more, however, the man continuing still to complain of his mouth, a careful examination was made, when the dead stillness of his countenance at once attracted attention. The lips were completely palsied and could not be closely shut, the nostrils could not be curled, the upper eyelids could not be closed, and he could neither laugh nor whistle. At the same time the sensation of the affected parts was everywhere perfectly entire. He had not the slightest fever, no headach or local pain of any kind, except soreness of the mouth; and his only complaint, indeed, was of the dryness and soreness of his lips.

Low diet was ordered, blisters were applied behind the ears, and leeches immediately before them, and laxatives were frequently administered; but without the slightest advantage. About this time the last patient, with palsy of the *motor oculi*, recovered apparently under the operation of mercury. The same treatment was therefore applied in the present instance, and a smart salivation was brought on, which terminated in a copious impetiginous eruption over the whole face. The patient, however, did not derive the slightest benefit. All the parts supplied by the muscular portion of the seventh nerve on each side of the face continued in a state of perfect paralysis. After remaining three months in the hospital he was dismissed in the same condition; and I have never since been able to receive any information of the progress of his disease.

3. *Paralysis of the Portio Dura of the Seventh Nerve of the Right Side.*—When in the country last autumn, I was requested to visit a young man who was supposed to labour under palsy. His paralytic affection was of five or six days' standing; and it was preceded for some days by severe aching pain in the whole right side of the face. When I saw him the pain had ceased; but the whole right side of his face was completely paralyzed. In a state of repose it did not present any peculiar appearance, except considerable depression of the right eyebrow. But on careful examination I found that he was unable to whistle, to curl up the right side of the nose, to elevate the right eyebrow, or to close the right eyelid, and when he laughed the mouth was drawn much to the left side. The right eye watered a good deal, and when told to close it, he closed the lids imperfectly, and turned the pupil upwards beneath the upper eyelid.

He complained of acute pain on pressure upon the cheek in the region of the exit of the infra-orbitary nerve, and likewise in the jaw at the exit of the inferior maxillary nerve upon the chin, also of *tinnitus aurium* when at work. He had never had headach, or any pain or swelling before or around the ear; neither was there ever any weakness of the limbs or arms, any material difficulty in speaking, or divergence of the tongue from the straight position when thrust out. The sensation of the cheek, too, was quite entire. The pulse was natural.

I recommended him to have a blister applied frequently before and under the right ear, and after following this plan of treatment to resort to a mild course of mercury, if he was not relieved. Six blisters were in consequence successively applied between the close of September and beginning of December, and during the latter part of that period mercury was given so as just to affect the mouth.

Some amendment was remarked after the application of the last blister, which extended from behind the ear to the chin, and acted very severely. Till then he experienced no improvement, and since then he has made but little progress. I am unable to state the precise amount of amelioration that has taken place; but I have been informed by the clergyman of his parish, that he can now close the right eyelids completely, but does so very slowly,—that the other palsied actions of the muscles of the face appear to remain nearly as when I saw him,—and that he has still acute pain on pressure on the cheek under the eye, or on the lower jaw near the chin,—but that he continues entirely free of general palsy or any head symptom.

Aug. 18, 1834. The patient eventually got quite well.

4. *Palsy of the Optic Nerve?*—The next case to be mentioned I have entitled palsy of the optic nerve; although I believe the propriety of the name is doubtful.

A middle-aged man, of meagre habit, and very deeply scarred with small-pox, was admitted in the summer of 1829 into the surgical department of the Infirmary, on account of chancres and bubo. The chancres soon healed; but the sore left in the groin after the suppuration and opening of the bubo was untractable. While in this state, he was attacked with dysentery, which at that time (autumn 1829) prevailed in the hospital, and was so fatal that about a fourth of those who were taken ill perished. Being transferred to the medical department on account of the dysenteric attack, he became my patient. At this time he had dysentery in its worst form, and although the acute stage was soon subdued, the symptoms nevertheless showed that extensive ulceration had taken place in the intestines; and he died six weeks after I saw him.

At first no attention was paid to the circumstance of his being blind of an eye, as the marks of severe confluent small-pox seemed to account for it sufficiently. But on his mentioning to me incidentally, that the sight was lost only two years before, careful inquiry was made; and it was then learned, that, on the occasion alluded to, he had been a patient in St Bartholomew's Hospital, London, with severe headach, giddiness, feverishness, and incomplete palsy of one of his sides; and that he gradually got the better of these symptoms, but was at the same time attacked with inflammation of the left eye, which burst, and became totally blind.

It was natural in these circumstances to expect that some injury would be found in the course of the fifth nerve. This nerve, however, was found quite healthy so far as the sight and touch could determine. But the optic nerve of the affected side, between its exit through the orbit and its decussation with the opposite nerve, was not more than half the breadth of the other, and was gray in colour and flaccid in texture. Between the point of decussation and the thalamus of the opposite side it was of the natural whiteness, but softer and less than its fellow; and the *thalamus* itself was somewhat flattened. The brain was otherwise healthy, except that a very great watery effusion had taken place under the arachnoid coat over the whole external surface, which appeared to account for the severe headach and frequent incoherence remarked towards the end of his illness. There was no appearance of an old cyst or other disorder in the substance of the brain. The colon was covered to an enormous extent with ulcers in various stages of progress. The left eye was completely disorganized.

I am quite aware, that, in calling this case palsy of the optic nerve, I may err in taking for the cause of the destruction of the eye what was really its effect. Neither do I pretend to say that there is much probability in the view here given. But it appears to me right to make known the particulars, because it is not impossible that diseases of other parts of the nervous system besides the fifth nerve may lead to destruction of the eye, and this is presumptively a case of the kind, the presumption being founded on the bursting of the eye having been immediately preceded by some organic disease of the brain, and being not associated as usual with disease of the fifth nerve.

18. *Three Cases of Palsy of the Muscles supplied by the Portio Dura on one side of the Face, connected with different organic changes within the Head.* By the late Dr J. C. Gregory.

Since the publication of Mr Charles Bell's discoveries in the nervous system, the affection commonly known under the name of Blight, or palsy of the muscles supplied by the *portio dura* on one side of the face, has attracted particular attention, on account of the beautiful illustration which it affords of the separate endowments of the facial nerves.

This local paralysis sometimes arises from temporary causes, —such as partial exposure to cold, swelling of the parotid gland, or of the lymphatic glands near the mastoid process, or the angle of the jaw, &c. acting upon the *portio dura* in some part of its course after leaving the cranium. In these cases the affection is well known to be attended with no danger, and is generally transient. But it becomes much more serious when, without apparent external cause, the palsy of the muscles is complete and permanent, especially if accompanied by purulent discharge from the ear, deafness on that side, or other symptoms indicating diseases within the head. Cases of this description are by no means rare; but comparatively few, in this country at least, have been recorded, in which the symptoms were satisfactorily explained by examination after death.

Four well-marked cases of this permanent palsy of the muscles of one side of the face have fallen under my notice within less than two years; and on examination, after death from other causes, the local affection was found to have arisen in all of them from different organic changes. One of these, which had been attended with purulent discharge from the ear, and deafness, and was found to have been caused by extensive suppuration and caries of the *pars petrosa*, and consequent destruction of both portions of the seventh nerve in their passage through the temporal bone, has been already published by Dr Abercrombie in the second edition of his work on the Diseases of the Brain and Spinal Chord. (P. 443.)

I now propose to give a very short account of the three cases I have since met with, in the hope that other members of the society may be induced to favour us with the result of their experience in regard to this singular affection.

Case I.—Thomas Mill, æt. 40, had been subject from childhood to a purulent discharge from the right ear. This ceased about five years before his admission into the Infirmary under my care, in April 1830. The cessation of the discharge was, however, soon followed by total deafness of that ear, and complete palsy of all the muscles upon which the *portio dura* of the right side is distributed. His mouth was so much distorted towards the left side, and his articulation in consequence so indistinct, that, in order to make himself intelligible when speaking, he was obliged to place his finger at the angle of the mouth on the right side, and to draw it back to its natural position. He was unable to close the right eyelids, and even during sleep the eye remained partially open. It never appeared, however, to be at all inflamed. The right *ala nasi* remained without motion, while the left was dilated during the movements of respiration, and he was unable to raise the eyebrow of that side. The sensibility of the affected parts, as well as the actions of the temporal, masseter, and pterygoid muscles, remained unimpaired. He stated that he had never suffered any pain in connection with this affection. He was a patient in the hospital for nearly three months, during which it underwent no change, and he never complained of headach, or had any symptoms indicating disease of the brain. He died, gradually exhausted by protracted jaundice, arising, as appeared on dissection, from disease of the pancreas, and on account of which he had entered the hospital. His faculties remained entire till within a few hours of his death.

On examination, a remarkable tumour, of cartilaginous consistence and pearly lustre, of the size of a walnut, was found projecting from, and firmly imbedded in, the *pars petrosa* of the right temporal bone. It encroached upon the *meatus internus*, and strongly compressed both portions of the seventh nerve just at their entrance into the bone. The *portio dura* did not appear altered at its origin, but was somewhat diminished in size as its passes out at the stylo-mastoid *foramen*. The tumour had caused a depression on the surface of the corresponding portion of the convolutions of the brain, but without giving rise to any disorganization. There were no marks of increased action, or vascularity around the tumour; and the *dura mater* covering it appeared quite sound.

From the absence of all symptoms of disease in the brain, and from the exact similarity of the symptoms, which did exist, to those of the case already mentioned, there was no difficulty in coming to the conclusion, that the temporal bone was the seat of the disease in this case also; and, accordingly, I did not hesitate, from the time that this man came under my care, to point it out as a case of palsy of the muscles, supplied by the *portio dura*, arising from disease of the petrous portion of the temporal bone.

Case II.—Elizabeth Allan, æt. 35, had been seized with vomiting and diarrhœa about a fortnight before her admission into the Clinical Ward in May 1830, under Dr Duncan, to whose kindness I am indebted for the history of this woman's case, while she remained under his care.

At the time of her admission, her mouth was distorted towards the left side, and she had considerable difficulty of articulation. She could not close the right eyelids; and she had pain and lachrymation of the eye, but without apparent inflammation. She also complained of deafness of the right ear. There was a painful indolent swelling of considerable size, and deep-seated, between the mastoid process and the angle of the jaw on the right side, which was reported to have existed for some time.

She had a variety of other symptoms, of which the most prominent were headach, generally referred to the right side, and frequent and troublesome vomiting, generally ascribed to articles of diet, or to the remedies employed. While in the Hospital, she had for some time a copious purulent discharge from the right ear, during which the sense of hearing in it was partially restored.

Her articulation became more distinct, and the swelling at the angle of the jaw diminished much in size, and became less painful under the internal and external use of iodine; and when dismissed from the Hospital in July, the swelling was reported as nearly gone, and her hearing much improved. Her headach and stomach complaints were also much relieved. But she was still unable to close the right eyelids, and all the movements of the features on that side were imperfect. The sensibility of the affected parts was unimpaired, and the action of the temporal and masseter muscles remained natural.

This woman was readmitted in the month of October of the same year, under the care of my colleague, Dr Shortt, with severe general headach, *tinnitus aurium*, impatience of light, contracted pupil, and slight strabismus. These symptoms had been preceded by nausea and vertigo. The vomiting had recurred, but she did not vomit all ingesta. The external tumour had again increased in size; the paralytic affection of the right side of the face continued as before; and the deafness of that ear had returned. Her articulation was indistinct, and she appeared rather to avoid motion of the head. During her residence in the Hospital on this occasion, she had an attack of erysipelas, spreading from the head, to which a blister had been applied, over a great part of the body, and attended with an evident improvement of the other symptoms under which she laboured. But this did not continue long, and she died in November, in a state of great debility and emaciation, but without preceding coma or convulsions.

On examination after death, the external swelling, which was firm and partly scirrhous in its texture, was found to form part of a large irregular tumour, or perhaps rather a chain of tumours, intimately connected together, and apparently of a similar character, which had caused caries and absorption of the cuneiform process, and right condyle of the occipital bone, and also of a considerable portion of the *pars petrosa* of the temporal bone of the right side, where part of the tumour was firmly and deeply imbedded. It occupied a considerable space in the right *fossa cerebelli*, so that the right lobe of the *cerebellum*, the *tuber annulare*, and the *medulla oblongata*, were compressed, and pushed towards the left side. Both the *corpora restiformia* appeared flattened. The origins of the seventh and eighth nerves, on the right side, were softened, and compressed by a portion of the tumour, over which the fibres of the glossopharyngeal and lingual nerves were stretched. The sixth nerve of the same side was also exposed to pressure in its course. A small firm tumour of the size of an olive, along with a portion of the larger tumour to which it was loosely attached, had penetrated to a considerable depth in the substance of the right lobe of the cerebellum, but had caused little or no disorganization.

In this, which is in several respects a remarkable case, we find, as in the former cases, that there had been deafness, and purulent discharge from the ear of the affected side, and, like them, the petrous portion of the temporal bone was found to be the seat of disease, although of a different kind. These symptoms were the more important in this case, that the presence of the external tumour, at the angle of the jaw, might have led to the conclusion, that the pressure exerted by this tumour upon the *portio dura*, after it leaves the cranium, was the sole cause of the paralytic affection of the face. The destruction of considerable portions of the occipital and temporal bones in this case, and the pressure exerted by this large tumour upon the cerebellum, the tuber, and the medulla, and particularly the disorganization of the eighth nerve, at its origin on the right side, afford a striking proof of the extent to which organic disease, provided it be slowly formed, may exist without giving rise to very urgent and speedily fatal symptoms, even in parts, the integrity of which is so essential to life. It is also worthy of remark, that the headach and vomiting, which for a long time were the only symptoms referable to disease affecting the contents of the cranium, were very much relieved on two different occasions; *first*, when she was in the Clinical Ward, under the use of iodine; and, *secondly*, shortly before her death, when the tumour had probably attained its full size, by the appearance of the erysipelas.

Case III.—Marianne Chalmers, æt. 34, had been a patient in the Infirmary early in the spring of 1830, on account of hemiplegia of the left side, from which she had almost entirely recovered, and had left the hospital in March. About three weeks before her admission into the Clinical Ward under Dr Alison, in November, she was seized with severe pain of the right side of the head, which continued about twenty-four hours, and was succeeded by complete paralysis of the muscles of the right side of the face. The mouth was drawn towards the left side. The right *ala nasi* remained immovable during the action of respiration; there was palsy of the *orbicularis* of the right eye, the vision of which was indistinct with lachrymation; she had complete amaurosis of the left eye, with occasional drooping of the upper eyelids; she never had any discharge from the right ear, in which the sense of hearing was not observed to be impaired; she had numbness, with some loss of power, in the left arm, apparently connected with the former *hemiplegia*. The sensibility of the affected side of the face remained unimpaired, and the action of the muscles of the jaw was natural. At the time of her admission she had no headach, but she was subject to occasional palpitations; the impulse of the heart's action was stronger than natural, and the stroke of the apex was felt below the sixth rib; there was great œdema of the lower extremities, with extensive erythema, and sloughing ulcers of the legs.

The dropsical symptoms diminished for a time under treatment, and she was transferred to the surgeons, on account of the extension of the ulcer on the legs. But the œdema again increased, along with diarrhœa, diminution of discharge from the ulcer, and ultimately stupor, and she died in December, without change on the paralytic affection of the face.

On examination, a considerable quantity of serum was found in all the cavities of the brain. In the right *corpus striatum*, there was an irregular cavity several lines in diameter, without hardened edges, and containing a reddish flocculent matter. In the lower and posterior part of the *tuber annulare*, there was another small cavity of irregular form, which only contained a little cellular substance. This cavity extended towards the right side, in the direction of the origin of the seventh nerve, and at this point it approached very near the surface. The *portio dura* appeared somewhat diminished in size at its origin, but there was no disease of the temporal bone. A number of small opaque spots were observed in the coats of the arteries of the brain. The heart was larger than natural, and there was hypertrophy of the left ventricle, with diminution of its cavity. There was slight thickening and corrugation of the aortic valves.

This case forms a good contrast with the preceding ones. There had been no discharge from the ear or deafness in this case; but the former hemiplegia, and the amaurosis of the left eye, with the drooping of the upper eyelid, furnished good evidence of disease in the brain, to which the diseaſe of the heart and arteries had probably given the predisposition. It was therefore reasonable to conclude, from the symptoms during life, that the palsy of the muscles of the face was here the result of disease in the brain, and not in the temporal bone. There can be as little doubt that this affection was connected with the cavity extending to the origin of the seventh nerve, as that the hemiplegia had been connected with that in the *corpus striatum*.

§. VII.—MORBID CHANGES IN THE SPINAL CHORD.

19. *Case of Spontaneous Luxation of the Vertebra Dentata.* By WILLIAM THOMSON, M. D. Fellow of the Royal Colleges of Physicians and Surgeons, Edinburgh.

By the kind permission of Drs Burt and Hay, I had an opportunity of being present, in the course of last summer, at the inspection of the body of a patient of theirs, who died very suddenly and unexpectedly, and in whom death appeared to have been produced by a spontaneous dislocation of the *vertebra dentata*, not accountable for by any symptoms of disease observed during life; nor by any traces of morbid alteration of structure in the bones, articulating cartilages, or connecting ligaments, that could be detected on examination after death. Agreeably to their wish, I have now the honour of submitting a brief statement of the particulars of this case to the Society,—a task which I have undertaken the more readily, that, from conversation with professional friends, as well as from an examination of those works in which similar cases might be expected to be met with, I am led to believe it to be one of extremely rare occurrence.

Mr P. B., the subject of this case, was about 60 years of age, and enjoyed, in general, a good condition of health. For some years before his death he was subject to attacks of sore throat, which were occasionally of a severe character, terminating in the formation of large abscesses. Immediately before his death he had experienced a somewhat severe attack of cold; but from this he had so far recovered, that, with the consent of his medical attendants, he was to have driven in a carriage a few miles out of town on the day on which he died.

On the morning of that day, when Dr Burt called about nine o'clock to make his ordinary visit, he was informed, that as, contrary to custom, Mr B. had not yet rung his bell, it was supposed that he was indulging in a longer sleep than usual. On approaching the bed, after opening the window-shutters, Dr Burt was very soon convinced that his patient was a lifeless corpse. He was lying upon his back, very far up in bed, with his head thrown very much backwards, and hanging over, so as to be almost behind, the pillow. His countenance was very pale, and, from the temperature of the body, Dr Burt was disposed to believe he could not have been dead for more than two hours. Nothing, however, could be discovered, justifying an opinion at what particular time, or in what particular manner, death had occurred.

The attempt to ascertain by dissection the cause of death in this case was commenced by the examination of the thoracic *viscera*, but no appearances could be detected in the heart or large vessels connected with it, or in the lungs, capable of furnishing the slightest explanation of this sudden and unexpected occurrence. It was remarked, however, that the whole of the blood in the body was in a fluid state, affording, as we conceived, a presumption that death had been instantaneous. The contents of the abdomen, including its large vessels, being also found in a healthy condition, it was resolved to open the *cranium*.

The whole of the *encephalon* was minutely examined without any appearance of disease being discovered in it, and we were about to relinquish all hopes of detecting the cause of death in any organic lesion, when a round knob was observed projecting into the *foramen magnum*, at the posterior margin of the basilar process of the occipital bone. At first this knob was supposed to be a tumour growing out of the basilar process, with which it appeared to be in continuity, but on accurate examination, by rotating the head whilst this knob was grasped by the fingers, it was found to be the *processus dentatus* of the second cervical *vertebra*. As examined through the *foramen magnum*, no mark of disease could be discovered, either in the process itself, in its ligamentous coverings, or in the adjacent *vertebræ;* and no laceration of the coverings, or of the substance of the spinal chord, had been produced by it.

We have to regret that the length to which our examination had already been carried, and the impossibility of bringing the parts into view without mangling the body to a degree which we were not warranted in doing, prevented us from ascertaining the exact state of the *vertebræ* and their ligaments; but, by dissecting from the *nucha* round the *vertebræ*, we were unable to detect any swelling or other traces of inflammatory action either in the bones, or in their connecting cartilages and ligaments.

Neither Mr B.'s medical attendants nor his relations had ever heard him make the slightest allusion to any pain or uneasiness in the region of the neck, and the only circumstance which occurred to them as bearing in the most distant degree, on the supposition of disease existing in this region, was a habit he had of occasionally twitching his head to a side, as if to relieve himself from some tightness of his shirt collar or neckcloth.

In my father's Surgical Notes I find it mentioned, that "Mr Cruikshank, when treating of the spine, shows a dislocation of the *dentata*, which occurred in a woman from a sudden motion, and which was followed by sudden death;" and I find the following fuller, though still incomplete, account of the same case, in an abstract of a selection from an unpublished volume of Anatomical Reports, by the late respected anatomist Mr Wilson of London, published in the London Medical Gazette, Vol. iii. 1828-29. [*]

"*Luxation of the Dentata.*"—Mr Wilson assisted Mr Cruikshank in examining the body of a woman, aged 30, who had lain-in about a month before. She had been heard suckling her child at one o'clock in the morning; at four she was found dead. The viscera of the abdomen, thorax, and head, were carefully examined, without finding any thing to account for her death; when, as they were returning the brain into the skull, Mr Wilson noticed a considerable projection on the fore-part of the *foramen magnum*. On examination, this was found to be the denticular process of the dentata luxated backwards, and which had produced a degree of pressure on the spinal marrow sufficient to destroy life."

This is the only case I have been able to find recorded that corresponds in its nature to that which I have now submitted to the Society, that is, a case of luxation of one of the superior cervical *vertebræ*, independently of external violence, or of the previous existence of well-marked symptoms of disease. Indeed, I am the more induced to believe that this is an extremely rare occurrence, from finding that no allusion is made to it in a very learned inaugural dissertation written expressly on the subject of Spontaneous Luxation of the *Atlas* and *Epistropheus*, by Dr Schupke, a pupil of the celebrated Professor Rust. All the instances of the spontaneous luxation of these *vertebræ* referred to by Schupke, depended on the effects of inflammatory action, evident symptoms of which had manifested themselves during life.

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[*] Since the above communication was laid before the Society, I have, by the kindness of Dr J. A. Wilson, had an opportunity of reading Mr Cruikshank's case as detailed in the MS. volume above referred to, and have been enabled, by the restoration of a few words, to render the following statement of it somewhat more precise.

20. *History of a Case of Paraplegia from injury of the spinal chord, causing Inertia of the Kidneys, and other anomalous symptoms.* By John Home Peebles, M. D. Fellow of the Royal College of Physicians, Edinburgh.

The history of the following remarkable case has already been given to the public by Dr Montesanto of Padua, in the 47th Volume of the *Annali Universali di Medicina*, published at Milan by Dr Omodei. It was previously read before the Royal Academy of Padua at its sitting of the 17th of June 1828, and continuations of the history were communicated to the same Institution on the 19th of April 1831, and again on the 9th of July last year. The whole has been published in the form of a pamphlet, which has been extensively circulated, and Dr Montesanto has done me the favour to send me a copy of it, from which I have gathered the greater part of the interesting information I now lay before the Society.

From that narrative it appears that the patient Domenico Valetto, then in his 18th year, fell accidentally from the third story of a house,—a height of about fifty feet. By this fall he did not receive any fracture, or lesion of the surface of the body; but blood suddenly flowed in great quantity from the mouth, nostrils, and ears. Severe pain immediately followed across the lower part of the abdomen, over the loins, and along the whole of the vertebral column, rendering the man immoveable, and showing at the moment the effects of an internal general concussion. Medical aid was instantly procured, and after the use of suitable remedies, he could in no very long time resume the exercise of his trade, which was a distiller of spirits. But his health was never completely re-established, and he always complained after this severe accident,

1. Of pain in the lower part of the abdomen and in the back.
2. Of a difficulty of bending the body.
3. Of an impediment in the passage of the food, which occasioned a weight in the stomach, and something like a knot in the throat. This weight and swelling sometimes disappeared, and were sometimes followed by vomiting of aliment.

4. He complained also of costiveness, and the feculent matter was generally covered with whitish mucus mixed with streaks of blood.

Lastly, of a deficiency of urine, which always deposited a sediment.

He did not, however, take particular notice of these disorders, but continued to occupy himself with his affairs. He lived a very irregular life with his companions, although he could never take much exercise on account of a difficulty of breathing, which was produced by more than ordinary exertion, and the quantity of urine becoming at the same time scarcer.

In this imperfect state of health and licentious mode of living he spent about two years, when he was drawn into the commission of crime on the highway, for which he was arrested, and committed to the Prison at Padua.

Many months elapsed without his uttering any complaint about his sufferings; but after two years of detention his disorders increased so severely, that he was at last forced to call for assistance. He was now attacked with acute fever, severe pains in the lower part of the abdomen, chest and back. He had aversion to food, and nausea often followed by vomiting. In this state he was placed in the infirmary of the prison on the 10th of March 1819, when he was treated by general and local bleeding, fomentations, injections, and purgatives, and, in short, by every means calculated to remove the symptoms.

The fever was thus in a short time overcome; the pain was rendered milder; but the costiveness, sense of weight in the stomach, in the loins, and lower part of the abdomen, the nausea and vomiting after eating remained constant. The use of such means were continued as his situation would allow; but nothing availed in ameliorating the morbid state, which, on the contrary, increased by degrees, with complete paralysis of the inferior part of the body, and the patient became deprived of all sense of feeling from the waist to the feet, and entirely of any power of movement of the lower extremities. The bowels remained closed, and there was no secretion of urine. He, however, now began to have a good appetite, and could eat every kind of food, except boiled meat and broth, which he refused, as also wine. Always after dinner he drank much water; he then remained well for several hours, when he began to feel a desire for more liquid, to assist in freeing himself by vomiting of the troublesome sensations which the food now occasioned, and which was very soon rejected.

It was observed that this vomiting after dinner happened daily; but after a period of 30 or 40 days, and sometimes longer, vomiting occurred of another kind, preceded by the following phenomena. He began to experience in the stomach a movement similar to that produced by a ball ascending towards the fauces. He was seized with hiccough, which lasted about four hours; vomiting then ensued; gross fecal matter mixed with blood was rejected; and after the alimentary canal was thus unloaded, the hiccough ceased, and the stomach became settled.

His sleep at this time was observed to be of short duration, but tranquil; the pulse sufficiently vigorous and regular; sweating never occurred in the hottest weather. The heat of surface was always natural, and nutrition sufficient all over the body, the lower extremities excepted, which became somewhat wasted, and totally immoveable and incapable, without aid, of any flexion.

The ancles became so stiff that they could not be moved, and the feet so permanently extended in a tetanic form, that the toes were in a direct line with the tibia. He became unable to lie supine, or to raise himself on the trunk, or to turn on his sides. Behind or before he was supported by pillows, which he adjusted as he pleased when he wished to sleep for some hours. Although he was aware that the Tribunal had condemned him and his companions from 1821 to perpetual confinement, he preserved his spirits cheerful and tranquil.

The above account of the state of this patient's disorder was communicated by Dr Menato, Physician to the prison, to Dr Montesanto, on the retirement of the former to fill another appointment. He then requested Dr Montesanto to visit the invalid along with him. At this time he had been about eight years under the care of Dr Menato in the state already mentioned.

He was now carefully examined. The pulse was found to be 60 and regular, as well at the wrist as at the groin, ham, ancles, and elsewhere: but the tone of the arteries was rather resistent, which, with an oppression of breathing, indicated a necessity for bleeding, as at other times during the last three years. The heat of the body examined by the Centigrade thermometer was that of a healthy person, and it was equally diffused. His aspect was not cast down, the tongue was clean, and the abdomen was free from tenderness or pain on pressure; the muscles were, however, somewhat contracted and very resistent at the epigastrium. The vertebral column was examined with great attention. There was not the least alteration observed in its external form; but pain was occasioned by pressing very gently on the part which corresponds with the spinous processes of the last dorsal and first lumbar vertebræ,—a point where the patient said he felt a constant internal, though not acute pain, and where he was conscious of a hindrance to the free movements of the trunk; beyond this part the spine was not painful. From the region of the last lumbar *vertebra* every sense of feeling had ceased. This absolute insensibility was proved by many decisive means to be manifest in all parts which are included in a line drawn from the last lumbar *vertebra*, and stretching along exactly by the right and left superior brims of the pelvis to a little above the *pubes*, and thence down to the feet.

It is here to be remarked, that though the site of the injury of the spine and the chord be, as already stated, at the last dorsal and first lumbar *vertebræ*, yet the loss of sensation, owing to the oblique course of the nerves issuing from the spinal chord, is much lower than the part of the spine injured.

The result of these observations often repeated is the conviction that the disease originated from an injury of the vertebral column, producing morbid changes in the spinal marrow and its investments, and the branches of nerves which arise from it. This disease began to give the first indication of its existence soon after the fall in 1816,—maintained a mild character for upwards of three years, and in 1819 assumed in the prison the form of acute *myelitis*. Paralysis of the inferior half of the body followed, with total suppression of any discharge by the rectum or urethra. The progress of these symptoms has already been described, and the disease does not appear to have presented any difference in its character from the time Dr Montesanto examined the patient, till the end of August 1828, when, after more than sixty days had elapsed without stercoraceous vomiting, Valetto suffered extraordinary distress. During three successive days in the beginning of September, this vomiting was renewed, and again on the 11th and 17th.

Febrile symptoms now appeared, and it was necessary to have recourse to blood-letting on the 24th. Next day he had vomiting of the same nature in large masses mixed with bloody matter. On the 26th the patient had still fever, and was much enfeebled. On the 15th of November following the fecal vomiting appeared again, and once more on the 5th of March 1829. In all these evacuations no urinous smell could be perceived, nor did the body of the invalid give any odour of this kind. To this particular attention was paid, in consequence of the experiments of Mayer on the extirpation of the kidneys.

After the cessation of the stercoraceous vomiting, the daily vomiting of food returned as usual, but it is remarkable that at present it happens sooner than formerly, that is, about two hours after eating, and the substances swallowed are returned much in the same state, and little or nothing diminished in weight, as proved by apposite examinations made in August of the year following.

The order of the phenomena presented in the disease was not materially altered by this change, except that plethora was now produced with greater facility and frequency, requiring the use of bleeding in shorter periods; and it appears from the journal of the prison, as well as that kept by Dr Montesanto, that during the two years after the cessation of the fecal vomiting, there were not fewer than sixty blood-lettings of twelve ounces each at least.

It is here observed, that, from the hardness and frequency of the pulse, the fever, the wandering pains in the thorax, and the oppression and shortness of breathing which he suffered from time to time, hydrothorax would in all probability have occurred, had not repeated blood-letting, general and local, and blistering, been resorted to.

It is of importance also to mention, that when the vomiting of fecal matter had become more rare, or when it was supposed to have ceased altogether, and when the symptoms of manifest inflammation of the chest arose, with fever and pains in various parts of the thorax, some *sweating* began to appear; an excretion which never happened before, not even in the hottest months of summer. This sweating, or more frequently a sensible perspiration, was discovered to exist, not only in the superior part of the trunk, arms, and hands, but also on the paralytic limbs, and these parts have in progress of time since become less emaciated. Notwithstanding this circumstance the paralytic condition of the inferior extremities is not changed, since the patient has always still a want of feeling and motion from the waist to the feet; and the organs of generation are comprehended in this space.

From the middle of July to the end of August 1831, the general health of our patient was comparatively in the best possible state; but about the first of September he had renewed attacks, and on the 11th of that month it was necessary to use blood-letting, which was repeated twice before the middle of October. Besides these occasional attacks of inflammation of the chest, which required bleeding, he was twice seized with indigestion from eating food which disagreed with his stomach. The last of these, which occurred at the end of March 1832, continued 15 days, during which time he had sharp and constant pains in the stomach and *spina dorsalis.* His pulse was quick, the fever intense, and there was no appetite. A bleeding of twelve ounces was prescribed and again repeated. The pain and fever were mitigated by the 3d of April; but they still continued in a considerable degree, and the patient talked of his approaching end; saying, he felt something rise from the bottom of his stomach, which in every attempt to vomit threatened him with suffocation. Every thing he tried to swallow increased his sufferings; spirits alone in small doses were at this time tolerated with a sense of relief. Nothing solid was retained on his stomach for 15 days, when, on the 11th of April, a spontaneous and unexpected vomiting took place of four masses of considerable size of matter purely fecal. One of these presented, more strongly than the others, certain impressions on the surface, which showed that these bodies had been formerly retained for a long time within an intestinal sac.

Besides such a solid and homogeneous matter, there was also discharged on this occasion a liquid substance of a greenish colour, and slightly odorous. A little after the fever was very mild, he was very tranquil, with the pulse weak, quick, and contracted; and in two days after he seemed to be restored to his former state. Thus were fecal materials brought away which had been formed gradually in the course of three years, that is, since the 5th of March 1829.

From this time nothing happened to change the usual mode of life. On the 16th of April 1833, he was reported to be "of good colour, of a cheerful aspect, and vigorous, well nourished, never better in health, and no return of fecal vomiting now for a year." He was bled on the 5th of this month for simple plethora, and again on the 14th and 17th of May, to lessen the turgescence of the blood-vessels. His continual actual condition, whether of strength or nutrition, is not very different from what has been described; and in this manner has now gone on for nearly 15 years, the course of a malady which, with its singular phenomena, is arrived at that state as to create a new mode of existence, and entirely peculiar to the individual.

It is difficult to comprehend how assimilation is effected, at least how those materials can be absorbed and circulated innocently in the blood, which all the elementary substances more or less contain, when we consider that the patient cannot take broth or boiled meat, but only salted-meat, dried salt-fish; cheese, and such like food. It is unnecessary to say that such substances cannot undergo the process of digestion during the very short time they remain in the patient's stomach, as he only eats once in the 24 hours.

The quantity of water which the patient consumes before the daily vomiting is upwards of 40 ounces, and must very much accelerate the exit from the stomach of that matter, which it might in vain try otherwise to get rid of.

I had an opportunity of seeing this interesting case when on a visit to Padua in the month of May 1829. At the request of Dr Montesanto, I accompanied him to the prison to examine the patient, and I find from my journal the following account of my visit.

The patient was placed in the Infirmary of the prison along with several sick prisoners.

Here I was informed they are so strictly guarded, that the jailer is never absent from the adjoining room through which we passed to the hospital, and nobody is allowed to visit them except the physician and surgeon, unless under particular circumstances, when an order from the governor is necessary. I was surprised when Dr Montesanto pointed out the unfortunate man at the upper part of the ward; for his appearance was so healthy that I should rather have fixed upon any of the other prisoners to be the person. He was sitting in bed preparing lint for the use of the hospital. His colour was rather paler than usual, which might well have been occasioned by the long confinement alone. His face was full, and his arms and body were also well covered with flesh; but the legs were considerably emaciated. The toes presented a singularly contracted and shrivelled appearance; and the feet were stretched out quite stiff, on a line nearly with the *tibiæ,* as if by violent spasms, and the heels were drawn upwards towards the back of the legs. The heat of the inferior extremities, however, and their colour were quite natural, but he declared he had not the least sense of touch, or any pain in them, nor the smallest ability to move them. This want of all feeling I traced along a line drawn from the lower lumbar vertebra across on each side to the spine of the ilium, extending downwards to a little above the *pubes.* All above this line the sense of touch was natural. I examined the spine, but found nothing deserving notice along the whole column, except at the part mentioned by Dr Montesanto, as near as possible at the under portion of the last dorsal and first lumbar vertebræ. Here there is an indentation or hollow place even visible to the eye, but very distinct on pressing the point of the finger into it, which gave him great pain. On his attempting to bend the trunk forward so much pain was produced in the back and epigastric region, that he was obliged to desist; and on endeavouring to lie down, he complained of so great oppression across the chest with difficulty of breathing, that he was forced to raise himself to that position, in which he has now been for ten years past.

I have already remarked that he is in nearly the sitting posture. In this way he always sleeps supported by pillows; his sleep seldom continues above two or three hours, and it is often disturbed.

The abdomen was somewhat full below the *umbilicus;* but it was soft and compressible, and there was no irregularity of surface, or hardness, or pain, on pressure in any part. The tongue was almost natural, only slightly furred; his breathing was quite natural. The pulse at my first visit 86, rather intermitting, but neither full nor contracted. Next day I found it 65, steady, and soft. This, Dr Montesanto said, was his usual pulse.

I was informed that he had been, and still is, in the habit of vomiting his food about four hours after eating daily, and every 30 or 40 days he is attacked with severe vomiting of the contents of the stomach and alimentary canal, mixed with feces tinged with blood. Before the vomiting comes on he complains of being sick, very uneasy in the stomach, with a rumbling noise within, which terminates in vomiting, What he vomits is, he says, the food very little changed; sometimes the rejected materials are rather bitter to the taste, but not the least acid. The jailer informed me he perceived sometimes the smell of urine in the matter vomited, but not of late. After vomiting, all the uneasy sensations immediately cease, and he is then quite relieved till next day. His thirst is often great, and he drinks commonly toast-water or lemonade. He says he has felt of late much weaker, but in other respects he is much in the same state as he has been for the last ten years. During the whole of this time I was told he had neither evacuation by the rectum nor urethra. He avoids wine altogether, as he finds it always occasion uneasiness in the stomach. His food is generally such as is allowed by the rules of the prison; but he lives chiefly on salted provisions, which he prefers to every other nourishment. The mind of the patient seems to be quite resigned, and he says he is free from every kind of suffering.

On my return to Padua early in May 1831, I again visited this patient. I found him in the same condition and position in which I saw him two years before. The state of the lower extremities was precisely the same, and I was informed that the other symptoms were not the least changed from what they have now been for twelve years, except that the fecal vomiting is less frequent, and the daily vomiting returns at shorter periods after eating.

When the history of this singular case was published, it excited much interest among the most eminent physicians in Italy and elsewhere, so that some of the professors not only discussed the subject in their lectures, but also introduced it into the medical journals; and many practitioners, both of the neighbouring provinces, and of foreign states, came on purpose to visit the patient. Among these were some who confessed that they had entertained doubts as to the accuracy of the statements; because, among the long series of facts recorded by medical observers, there were not any to be found that in any respect resembled this case. The legal authorities also requested to be informed of the precise nature of the facts which had been published concerning a man who had rendered himself by his crimes deserving the rigor of the laws. In consequence, a letter, dated the 18th of July 1829, of which the following is a translation, was written by Dr Montesanto, to the Count Selvatico, Vice-President of the Tribunal of Appeal, and Director of the Provincial Tribunal of Padua.

"Agreeably to the demand which your Excellency has done me the honour to make, I present to you along with this letter, the history of the very singular disease of the unfortunate Domenico Valetto, now confined in the Infirmary of the Prison; a history drawn up by me, and published for the purpose of informing professional men, of the circumstances of a pathological case, no example of which, so far as I know, is to be found in the most accredited collection of medical observations.

"This man, besides having the inferior part of the body paralytic from the waist downwards, has had neither intestinal evacuations nor urinary secretion for about ten years, during which time he has always lain as he does still, continually deprived of every motion of the inferior extremities, in bed in the infirmary. Vomiting in certain determinate hours after his daily meal, in this man, invariably takes place, of every other evacuation, without depriving him, however, of as much as is necessary for the support of life; and it so happens that this exists in him under laws unusual to human organization, and such as to reveal in a greater degree the wonderful resources of nature, even amidst the most difficult circumstances.

"The history of Valetto is therefore most interesting in itself, for which reason, with permission of your Excellency, and with the concurrence of Dr Celega, the ordinary physician to the prison, I continue to observe the course of the malady, on purpose that I may be able to give the best account of what is taking place in its progress. But although this person may be treated in the Infirmary of the Prison, like all the other prisoners, with every kind of charity, and on account of the extraordinary length of his malady, he may be regarded even with particular humanity; yet, since the peculiar circumstances of the place render it impracticable for the physician to make those accurate observations, which science demands in a case so important, and so capable of affording in its progress new views to the cultivator of physiological science, I would solicit that this man, who has been already so many years confined to bed without the power of moving, should, by superior orders, be transported to the Civil Hospital, of which I hold the place of director, and where the observations undertaken by me would be rendered more easy and more conducive to scientific purposes. This request, urged solely for the benefit of the art which I profess, is founded entirely on a knowledge of the facts which I have stated, and by your having it granted, you would do an act worthy a magistrate so respectable, and so enlightened as your Excellency."

Although the condition of the prisoner was not changed by this letter, nor was there greater convenience afforded thereby for observing the patient in the manner a medical inquirer would deem fit, yet it had the effect of putting a stop to the oft-repeated threat of subjecting him to the punishment of the pillory, to which he had been condemned, and from which some ill informed persons pretended to say he wished to escape under the pretext of exaggerated maladies.

Having written to Sir William Money, British Consul-General for the states of Lombardy, to procure farther information about the actual state of the patient, I received his reply, dated Venice, 24th January last. The following is an extract.

"When I was at Padua last month, in my way from Milan, I had an interview with Dr Montesanto, and communicated to him all you wished, and all the interest excited by the marvellous case of the poor and wretched paralytic in the infirmary of the prison at Padua. He is still alive, but has been attacked with fever, which it was then expected would soon end his miserable days; but he still lives. I have since I was at Padua received your letter of the 5th ult. which inclosed your's to Dr Montesanto, which I immediately forwarded to him. I spoke to him about the removal of the patient to the public hospital; but he said it could not be permitted, and that he was satisfied he was as well off in the hospital of the prison as he could be elsewhere. For myself I am thoroughly convinced that there is no deception whatever, and that deception under the circumstances in which the patient is placed is impossible. I therefore firmly believe in Dr Montesanto's statement of this wonderful case.

"I have received a letter from him with two copies of his publication, which I embrace the first opportunity of forwarding to you."

Dr Montesanto's letter alluded to is dated Padua the 12th of last January, and brings the latest intelligence of the patient.

"The pamphlets," he says, "which accompany this letter contain the history of the singular disease, concerning which His Britannic Majesty's Consul-General has done me the honour to request the exact particulars. The history has been communicated by me to my colleagues of the Royal Academy of Padua, the place where the individual lives who is the subject of my observations. Several of them have become personally acquainted with the reality of what I have stated in this history with every possible accuracy. Many eminent Italian and foreign physicians have alone and along with me visited and examined the patient, and I have undertaken to give to the public this account as minutely as possible, in order that every one who wished to do so may satisfy themselves of the accuracy of the extraordinary facts herein related. This is yet possible, as the patient is still alive." (Here Dr Montesanto gives the symptoms as already described, which need not therefore be repeated.) He then proceeds, "it is now about 21 months since he has brought up any fecal matter. For several days unusual pains of the belly, with swelling of the hypochondrium, and great tension had threatened new danger; but bleeding and emollient applications to the abdomen soon brought matters back to their usual state.

"The patient is, however, more deteriorated, and the pain he continually complains of in the *spina dorsalis*, where the *paraplegia* has its origin, is more acute than usual.

"Having observed the progress of this malady with attention for many years, and being anxious to keep an exact account of the disease, and what may be the result of the *post mortem* examination, that I may particularly inform men of science through the medium of the public medical journals, I shall likewise have the honour of transmitting farther information to any medical Institution, as I have already done to the Royal Academy of Paris."

This Academy at its sitting of the 26th of February 1833 had a discussion on a report drawn up at the desire of this Institution by M. Ollivier, which is alluded to in several of the Paris journals at the time, (in the Journal Universel et Hebdomadaire de Medecine of March, the Revue Medicale of the same month, and the Archives de Medecine of the preceding February.)

M. Ollivier mentioned that a similar fact was communicated to him by M. Denis of Commercy, in the case of a man who had received an injury on the spine, when only a few years old, which produced from that time a *paraplegia* with total suppression of both alvine and urinary secretions, and that the patient lived in that state 72 years. Although we should not hesitate in admitting the correctness of this statement by M. Denis, after the authenticated account of the case before us, yet it is to be regretted that such singular symptoms had not been communicated to other members of the profession, so as to have been made the subject of observation among them during the patient's life.

In presenting the history of the foregoing case in as short a form as the protracted nature of the phenomena would permit, I have been anxious to substantiate the facts therein related by evidence as satisfactory as the circumstances of the patient would allow. To the authenticity of several of the facts of the case I can myself bear testimony from personal examination of the patient. Thus, I can vouch for the truth of the statements regarding the indentation in the space between the twelfth dorsal and first lumbar *vertebræ*, the anaesthetic state of the integuments below the line specified, the paraplegic state of the lower extremities, and their shrunk and atrophied condition below the seat of the spinal injury, and the immoveably incurvated or inflected state of the toes.

The statements, that the patient has periodical fits of vomiting, preceded by a sense of obstruction in the throat; that the contents of the bowels are never evacuated; and that the urine has been entirely suppressed for so long a period, with the urinous odour of the matters rejected by vomiting, I should wish to rest on the observation of the jailer, and Drs Menato and Montesanto, who have observed the patient with much vigilance and assiduity.

I may remark, nevertheless, that when we reflect on the position of the patient, which must render almost impracticable any deception for so long a period; and, on the other hand, the serious responsibility of the attendants in such circumstances under an Austrian government, we must unite with Sir William Money in thinking that any attempt to impose in this case must be quite impossible.

Besides, the truth of Dr Montesanto's Reports to the Royal Academy of Padua has never been doubted by the members of that Institution, many of whom, individuals of intelligence and science, have frequently examined the patient. Nor have even the local authorities called in question the accuracy of these facts, which have been unreservedly laid before them.

In closing this communication, I should now make some observations on the singular phenomena here presented to our notice; but the length to which this paper has already unavoidably extended will oblige me to postpone any remarks to another time, when I hope I shall be able to lay further particulars of the case before the Society.

ART. II.—*Cases*, by G. HAMILTON, M. D. Falkirk, Extraordinary Member, and formerly President, of the Edinburgh Hunterian Medical Society.

CASE 1. *Symptoms indicating Pleuro-pneumonia, with perforation of the lung.*—About the middle of July 1833, I was called to see Thomas Hamie, aged about 50. He appeared to be a strong muscular man, and he and his friends stated, that, for the last twenty years, he had enjoyed uninterrupted good health. When I first saw him he complained principally of an acute pain, which he referred to the lumbar and hypochondriac regions of the left side. He also complained of great tightness of the chest, his pulse was strong and quick, he had some cough, and the *sputa* were tough, and were expectorated with difficulty. Upon applying the stethoscope to the lower part of the left side of the chest, the subcrepitating râle was distinctly heard; but the respiration in the rest of the chest was tolerably good. On the 5th of August these urgent symptoms were so far subdued by the ordinary antiphlogistic means that I considered further attendance unnecessary, only recommending that a small blister on the left side should be kept open for a few days, to remove a slight remnant of the pain, of which he occasionally complained.

On the 6th of September, exactly a month after I had considered this patient convalescent, I was again requested to visit him. I then found his appearance greatly altered. From being very muscular he had become much emaciated, and his countenance expressed a great degree of anxiety. For a fortnight after the 5th of August, when I had discontinued visiting him, he stated that he had gradually recovered his strength. After this period, however, it appears that his health began to decline, the left side at the same time becoming somewhat prominent, and, as he says, the prominence extending from below upwards.

On examining the chest, the left side was found to be somewhat more prominent than natural, and the ribs could not be so distinctly felt on this as on the right side. On the lower part of the left side, the patient complained of some pain, and on placing the hand on this part a distinct feeling of the crepitation of air in the subcutaneous cellular tissue was perceived. As the hand was passed upwards this feeling increased, and between the second and third ribs, near the *sternum*, there was a tumour about the size of half an egg cut in the long diameter. When this was gently pressed, it conveyed the feeling of air contained immediately beneath the skin ; and, when a greater degree of pressure was employed, of air passing through a fluid into the chest. When the pressure was removed, the tumour did not immediately reappear. When the patient coughed a strong impulse was at times conveyed to the hand through the tumour, similar to what is felt under the same circumstances in cases of hernia. On applying the stethoscope to the part of the chest where the tumour existed, a strong guggling sound was heard, along with, during respiration, the metallic resonance. Over a large portion of the anterior part of the left side, except where the heart is situate, the same sounds were heard, but less strongly. The respiratory murmur was wanting on the whole of the left side, except faintly at the back part near the spine. The sound on percussion on this side, both anteriorly and posteriorly, but especially posteriorly, was much duller than natural. The catarrhal râles were heard slightly on the right side. The *sputa* were muco-purulent, and were sometimes expectorated in large quantities. *Decubitus* on the left side.

For the pain on the left side he was cupped, and was ordered purgatives, to be succeeded by the use of calomel and opium.

Sept. 8. The cupping has relieved the pain of side. Complains that within these few days he has sweated much. States that he had to-day noticed for the first time a small quantity of blood in the sputa. Tumour, &c. on left side as before.

Sept. 15. Within the last week has been keeping considerably better ; appetite good ; sweating less ; can now lie on the right side without any inconvenience ; expectoration much less, and greatly improved in appearance ; the tumour on the left side has disappeared ; has some diarrhœa.

For the diarrhœa he was ordered a mixture containing catechu, and was also ordered to rub the *Ungt. Tart. Ant.* on the left side. The calomel and opium to be continued as formerly.

Sept. 17. Diarrhœa abated ; appetite good ; and sweating moderate. The sound on percussion on the left side anteriorly is not nearly so dull as formerly, and the ribs can now be more easily felt. On applying the stethoscope to the chest, rather lower than the middle of the anterior of the left side, *gargouillement* can be heard. On a level with the fourth rib anteriorly the respiration is cavernous. Beneath the clavicle, and close to the sternum, *gargouillement* is heard, but less distinctly than formerly. Respiration still wanting in the posterior part of left side.

For about a fortnight after this period the intensity of the *gargouillement* over the anterior of the left side gradually decreased, and at the same time the health of the patient rapidly improved. About the beginning of November he felt himself so well as to be able to work a little at his ordinary employment. I had not again an opportunity of examining his chest until the 27th of November, when the following was the state in which it was found. In the situation where the tumour formerly existed the skin feels more dense than natural, so that the rib cannot be accurately distinguished. On the anterior parts of the left side the respiratory murmur is heard distinctly, but only when a full inspiration is made, and the resonance on percussion is nearly as great as natural. On the posterior part of the same side the respiratory murmur is nearly as strong as on the healthy side, but the sound on percussion is still a little duller. The man is now strong, works as a porter, and has his appetite as well as ever.

I have not, since November last, seen this patient; but my friend Dr Spittal, who, as well as many other gentlemen in Edinburgh, had several times during his illness examined the tumour below the clavicle and the rest of the chest, was kind enough, at my request, to examine him for me. In a letter dated April 25, 1834, he states, "That all the indications of a healthy condition of the contained parts were perceived, but the percussion is still not quite so clear and elastic, nor is the respiratory murmur so distinct on the left side as on the right. The resonance of the voice sustains the same modification. The man continues in excellent health and strength."

The above case evidently furnishes us with an example of lesion of the thoracic viscera to an extent rarely recovered from; but, as to the precise nature of the affection, different opinions may no doubt be entertained. By the gentlemen who had an opportunity of examining the patient, I am aware, that at least three different opinions were held. In the *first* place, it was considered probable that this was a case of *phthisis pulmonalis*, and that the indications furnished by auscultation on the left side were the result of the evacuation of a large tubercular cavity in the upper part of the lung, and probably of several others inferiorly. Adhesion of the *pleuræ* opposite the large cavity, and afterwards ulceration outwards, were supposed to have occurred, and thus were accounted for the tumour under the clavicle, and the *emphysema* of the cellular tissue of the side. Along with this a collection of fluid was conceived to exist between the *pleuræ* posteriorly, giving rise to the dulness upon percussion, and preventing the respiratory murmur from being heard.

To this opinion three obvious objections presented themselves, 1*st*, That, less than six weeks before the tumour appeared below the clavicle, the patient had long been in the enjoyment of perfect health; 2*dly*, That the symptoms of the first attack, of which the second seemed to be but a continuation, were not those of phthisis, but distinctly those of *pleuro-pneumonia;* and 3*dly*, Even if it were admitted that phthisis commenced six weeks previously, the formation of so large a tubercular cavity as must here be conceded to exist, was evidently incompatible with the circumstance, that, on the whole òf the antero-superior part of the left side, the respiration at the commencement of the first attack was found to be nearly natural. It is true that cases of phthisis are recorded which have proved fatal in less than six weeks; * but I am not aware of any in which large cavities had been formed in so short a period. † Had any further evidence been wanting to refute this opinion, the result of the case will, I should suppose, be admitted as conclusive.

In the *second* place, it was thought that this was a case in which abscess of the lung had opened into the *bronchi*, and in which adhesion of the *pleuræ*, at the upper and anterior part of the left side, had also allowed ulceration outwards, and communication with the subcutaneous cellular substance. A collection of fluid or hepatization of the lung must likewise have been supposed to exist posteriorly. To this opinion the objections do not appear so numerous as to the last. The nature of the affection supposed to exist was quite in unison with that of which apparently it was a consequence. But does not the extent to which the metallic resonance, &c. were heard, being, as stated in the report of the case, over nearly the whole anterior part of the left side, except in the situation of the heart, render this opinion somewhat improbable? The existence, also, of such a vast abscess on September 17th, and the great disorganization of the lung, with which this must necessarily have been attended, would hardly, I should think, be compatible with the restoration of respiration to the same parts on the 27th November following.

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* Louis, sur la Phthisie, Case 33, &c.

† The author above referred to, in speaking of the formation of tubercular cavities of considerable size, says, " Nous avons vu, nous verrons encore plus tard, en parlant de la phthisie aiguë, que des excavations semblables ne se forment ni en six semaines, ni en deux mois; qu'elles supposent nécessairement que la maladie, dont elles sont la suite, existe depuis quatre à cinq mois au moins."—P. 377. On this point Andral seems to hold a different opinion, (see Clinique Medicale, T. ii. p. 550,) but he does not furnish sufficient details to enable us to form a decided opinion.

The last opinion in regard to the nature of this case which I shall mention was the one which, I confess, seemed to me from the commencement the most probable. According to this view, the present was, in the first instance, a case of *pleuro-pneumonia.* On the 5th of August, when the patient was left as convalescent, a certain amount of the pleuritic affection had probably remained unsubdued. Empyema probably followed; and the cavity of the *pleuræ* being limited by previous adhesions, as frequently happens in such cases, there was a strong tendency for the effused fluid to open both into the *bronchi* and externally. The first had taken place; the second very nearly so. This seems to me the simplest view of the case, as it would at once accord with the previous affection, and would account for the want of respiration, and the dull sound on percussion of the left side posteriorly;—for the large quantities of matter which the patient occasionally expectorated, as well as for the extensive guggling sound,* and the metallic resonance heard beneath the left clavicle.

The 3d of Dr Duncan's cases,† and Andral's 36th case,‡ resemble the one which I have detailed. Both were found on dissection to have originated from pleurisy with effusion; in both ulceration had taken place into the *bronchi*, and through the intercostal muscles; and in Dr Duncan's case, emphysema of the subcutaneous cellular tissue of the left side had taken place. In this last case also, it is remarkable that the process of cure had advanced so far as to have converted a case of *pneumothorax* into one of simple *empyema*,—the communication with the *bronchi* being discovered with difficulty, from the thick coating of lymph with which the *pleura pulmonalis* was covered. In all probability, in the case which I have recorded, there was a considerable effusion of lymph on both *pleuræ*, on the one hand, stopping up the communication with the *bronchi*, and, on the other, perhaps, accounting for the dulness on percussion, which was found to exist on the anterior part of the affected side. From the nearly perfect state, however, in which the respiration was found after recovery, what adhesions had been formed by the deposited lymph do not appear materially to have prevented the subsequent expansion of the lung.

The enlargement of the left side, and the difficulty of distinctly perceiving the ribs, probably arose partly from the emphysema. In all probability, however, the pleuritic effusion had first caused protrusion of the intercostal spaces; and this would agree with the account furnished by the patient, that the enlargement of the left side had proceeded from below upwards. Had the emphysema been the sole cause, the enlargement would probably have proceeded from above downwards.

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* "In the pulmonary excavation," says Laennec, (Forbes' Trans. 3d ed. p. 532,) "the cough sometimes occasions a guggling or slight fluctuation, which is never the case in pneumothorax." This, I apprehend, can apply only to cases where the cavity of the pleuræ has not become limited by former adhesions.

† See Edin. Med. Jour., Vol. xxviii.

‡ Clinique Med., Tome ii. p. 528.

CASE 2. *Melanotic Infiltration of the Lungs, with old and recent Pleuritis.*—Joseph Parker, aged 58, of rather dissipated habits, came under my care about the end of December 1833. At that period, he stated that his health had been for some time declining, and that latterly he had become so weak as to be incapable of following his ordinary employment. Upon examining him, his legs were observed to be considerably swollen, and the action of the heart was found much greater than natural. The sounds of the heart were also somewhat rough, not amounting, however, to the *bruit de râpe.* At this time he had some cough; the respiration anteriorly and laterally was nearly natural; but I did not then examine the chest posteriorly. He was put upon the use of digitalis; and diuretics and purgatives were prescribed.

In consequence of indisposition, I had not again an opportunity of seeing this patient for nearly two months; and when I then visited him, I found that the swelling of the lower extremities had nearly disappeared, and that he still complained of his cough, although this was not by any means severe. His general health had undergone little alteration. In the beginning of April he complained of severe pains in both ankle-joints, which were removed by the use of the wine of *Colchicum,* and stimulating liniments. The Colchicum apparently brought on diarrhœa at this period, which continued for some weeks, until gradually subdued by the use of a mixture containing catechu.

On the 14th of May I examined the chest. When the hand was slightly pressed below the ribs a little to the left of the sternum, the heart was felt beating strongly. The sounds were nearly as formerly in the region of the heart; but below the right clavicle, especially near its acromial end, a loud grating sound could be heard. The respiration anteriorly and superiorly was puerile, and the percussion was pretty good. Posteriorly above both scapulæ, but particularly above the right, a loud mucous *râle* was heard, and the voice was rather more resonant than usual. The respiration in the other parts of the chest which were examined was tolerably good. At this time the patient appeared to be gradually losing strength, but was not confined to bed, and he continued in nearly the same state till May 20th, when he was seized with violent pain on the left side, and great breathlessness, and expired the following morning. He had not sweated immoderately during the whole course of his illness, and his *sputa*, until within a few days of his death, were of a bluish colour. They are now reported by his attendants to have become perfectly black, as if they had been mixed with a quantity of soot.

Inspection.—Upon opening the chest, and pushing the hands between the *pleuræ*, the upper lobes on both sides were found strongly attached to the *pleura costalis*. Upon the *pleura* of the left lower lobe there was some apparently recently effused coagulable lymph. When pressed with the hand, a large portion of the pulmonary tissue seemed tolerably crepitating, interspersed, however, in all the lobes with indurated portions. Upon cutting into the pulmonary tissue, it presented universally an intensely black colour, exactly as if it had been infiltrated with soot or finely-powdered charcoal. This black colouring matter pervaded every part of the lung, but appeared to be collected into particularly dense masses in the portions above-mentioned, which had become indurated. Nothing like tubercular matter was found.

The heart was very little enlarged; its *parietes* and cavities being both in nearly a normal state. Some parts of the tricuspid valve appeared slightly indurated and corrugated. The valves at the mouths of the pulmonary artery and aorta were both perfectly sound. The ascending portion of the aorta was dilated, I should think, about one-third more than its natural size.

A small cyst was found in one of the kidneys, but, excepting this, the different abdominal *viscera* seemed to be very healthy.

The brain was not examined.

I transmitted part of one of the indurated portions of the lungs of this patient to my friend, Mr Graham, Professor of Chemistry in the Andersonian Institution, Glasgow. I learn from him, that, out of 200 parts, he finds more than ¼th, which he considers pure carbon.* It is obvious, therefore, that this is another case of spurious melanosis, for the first notice of which disease we are indebted to the late Dr J. Gregory.† Mr Graham informs me, that, while he was analyzing the specimen forwarded to him, part of the lungs of two other cases, similar in their nature, though not altered to the same extent, which had occurred in Glasgow, were handed to him for examination. Another case, also of the same kind I understand, occurred during last winter in the Edinburgh Royal Infirmary. Dr Gregory's patient had been for many years a collier, and all the three patients I have just alluded to followed the same occupation. The mode in which the carbonaceous matter had been conveyed into the lungs in Parker's case is very evident. He had been employed for forty years by the Carron Company as a moulder, in which occupation the workmen are continually exposed to the inhalation of a fine powder, composed in great part of very finely-ground charcoal. The *sputa* and *mucus* from the *nares* of those engaged in this employment are usually deeply tinged with this black matter, and a stranger cannot be present, while this powder is being used, without becoming sensible of the same fact.

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* I greatly regret that Mr Graham's absence from home has prevented me obtaining a more detailed analysis.—Mr G. however, I believe, intends publishing the analysis of this and the other cases which he has examined.

† Edin. Med. Journal, No. 109.

Mr Shaw, who was present at the *post mortem* examination of this patient, and who has long practised in this neighbourhood, had never seen the lungs altered in a similar manner. Upon making inquiries among the other surgeons in this vicinity, who must have had under their care many thousand patients employed as moulders, colliers, &c. I cannot find that this peculiar infiltration of the lungs had been previously observed. I am indebted to Mr Girdwood, surgeon, of this place, however, for the history of two cases, in which an examination after death was not obtained, but which, in their nature, in all probability, were analogous to the one I have detailed.

The first (Braid) had been a moulder in the Carron Company's work, but had been unable to follow any employment for eight months before his death. For the first four months of this period, the expectoration is described as having been similar to what we see in ordinary cases of phthisis; all at once, however, it is stated to have become black, and to have continued so until his death.

The other (Craig) had also been employed as a moulder. He had at first violent hæmoptysis, and the *sputa* were dark-coloured for a considerable time previous to his death. Both of these patients are described as having had otherwise many of the symptoms of phthisis, and the first had three daughters, all of whom died phthisical. Mr Girdwood informs me that he has repeatedly examined the bodies of persons who had been long employed as moulders, and who had died of various diseases, but has never remarked any thing peculiar in the appearance of their lungs.

My friend, Mr T. W. Jones, who was good enough to examine with the microscope the portion of lung I transmitted to Mr Graham, and who also saw the lungs in the cases I have alluded to which occurred in Glasgow, writes me as follows:

"I examined a bit of the lung you sent to Mr Graham, but I could not perceive that it had any definite structure. The black matter and the substance of the lung composed a confused mass. This might have been owing to the circumstance of the lung having been in spirits before I examined it, because, in another lung similarly, though not so extensively affected, I made out the following circumstances. The black matter existed in two different states; in the one it could be squeezed out along with the mucus of the lung, in the other it was contained in the interlobular cellular tissue; and a remarkable circumstance pointed out to me by Dr Craig is, that wherever the black matter existed in greater quantity, there the air-cells were dilated. On examining the matter squeezed out from the lung with the microscope, I observed that it consisted entirely of globules much larger than those of the blood; among these globules were numerous black bodies, which appeared to be globules containing black particles in their coats. On subjecting a bit of lung containing black matter to the microscope, I satisfied myself that the black matter was contained in the cellular tissue surrounding the air-cells, just as the earthy matter is deposited in bone. In no instance could I perceive that the black matter existed free in the air-cells."

CASE 3. *Symptoms of Fever combined with Peritoneal Inflammation. Death after taking two grains of Opium.*—Dec. 29. I was called to see J. L——, a girl, aged 16. Her friends state that, about a week ago, she was seized with symptoms of continued fever, since which time she had occasionally talked incoherently, and that four days ago considerable tenderness of the abdomen had supervened. At present she has great tenderness of the abdomen generally, from the pain of which she is incessantly crying out. Her bowels have not been moved since the abdominal pain commenced, and the pulse is about 120, and of tolerable strength.

Twelve ounces of blood were immediately taken from the arm, and warm fomentations were ordered to be applied to the belly. An enema of salts and senna, and four one grain opium pills were also ordered; one of the pills to be taken every fourth hour, unless the head should become affected.

Dec. 30. 1 P. M. The enema was not given until this morning, and the evacuation then produced was trifling. The whole of the opium pills have been taken, and the head has not been in the least affected. The patient continues in nearly the same state as formerly, the tenderness of the abdomen being still very considerable; and occasional stitches shooting up towards the chest are complained of. Pulse rather stronger, but about the same in frequency as yesterday. Blood not buffed, but slightly cupped.

Eight ounces of blood were drawn from the arm, and leeches, to be followed by fomentations as before, were ordered to be applied to the abdomen. Another large enema was also ordered, and one grain of opium to be given every hour until the pain was subdued, provided no head symptoms supervened.

8 P. M. Enema has not been given, and has had no evacuation. Only two of the pills have been given, as, after taking the second, considerable drowsiness came on. Is now very drowsy; opens her eyes when spoken to, but instantly relapses into a lethargic state. Makes no complaint now when the abdomen is pressed upon in any direction. Pulse nearly as before.

She was ordered to have three drops croton oil immediately.

Half-past eleven P. M. Coma has been increasing; is now almost wholly insensible, and the breathing has become stertorous. Swallows with difficulty; pulse about 140, and weak.

To have a teaspoonful of wine and water every ten minutes.

Dec. 31. Died this morning at 5 A. M.

A *post mortem* examination was not allowed.

The above case seems originally to have had all the symptoms of continued fever, which, after having existed for about a week, appears to have become complicated with a severe attack of peritoneal inflammation. These two diseases, existing in the same individual, may be said, I think, to require different, and, in some respects, opposite methods of treatment. At present, I imagine that most practitioners, who have given Dr Armstrong's treatment of *peritonitis*, viz. decided bleedings followed by the free use of opium, a fair trial, will grant, that the success attendant upon it is very great; and the perfect integrity of the sensorial organs which exists while large doses of the narcotic have been administered for this affection, has placed in a striking light an interesting and important therapeutical fact.

In continued fever, on the other hand, I am inclined to think, that, in certain stages of the disease, the danger of exhibiting opiates is even greater than practitioners generally allow. My attention was a good many years ago directed to this point, from two fatal cases having occurred in the practice of an intimate friend. In these, death from coma followed so quickly after the exhibition of doses of laudanum, not exceeding twenty-five or thirty drops, as to excite a strong suspicion in the minds of those who were attendant upon the patients, that the two held the relation to each other of cause and effect. I have since seen two other equally suspicious fatal cases. In the one, continued fever had become complicated with *bronchitis*, and a cough mixture, containing a very moderate quantity of the camphorated tincture of opium, had been prescribed. In the other, the fever had existed for eight or ten days. I had seen the patient during the day before her death, and found nothing in her condition to give much alarm. In the evening, she complained of some abdominal uneasiness, and I was sent for; but, being engaged, a young medical gentleman visited her, and ordered a draught containing thirty drops of laudanum. Upon visiting her early next day, I found that, soon after the draught had been administered, sweating so copious had come on as to drench the bed-clothes. Coma had then gradually supervened, and death took place within a few hours after I saw her.

I feel strongly inclined to suspect that the death of J. L., whose case I have detailed above, took place in the same way as those I have mentioned, and there are some circumstances connected with it, which, I think, are deserving of particular notice. It will be observed from the report, that, during the evening of December 29, and the morning of December 30, four grains of opium were taken without the head having been in the slightest degree affected by it. On the afternoon of December 30, on the contrary, two grains of the same drug appear to have been immediately followed by coma. Are there any circumstances in the case to account for this remarkable difference? I think there are. The remedial measures adopted on the 29th, it will be noticed, had not the effect of subduing the abdominal pain, and from what I have myself repeatedly seen, as well as from what has been so often noticed by others,* I have no doubt, that as long as intense peritoneal tenderness existed, even much larger doses of opium might have been given without danger. At 1 P. M. on December 30, however, eight ounces of blood were abstracted, and eight or ten leeches were applied to the abdomen. These means appear to have had the decided effect of removing the abdominal pain, as, in three hours afterwards, the patient could allow the abdomen to be pressed upon in any direction. I conjecture, therefore, that the two grains of opium which were given at this period, not having the peritoneal tenderness to counteract their narcotic quality, operated as they would have done in a case of simple fever, producing death exactly in the same manner as in the other cases I have alluded to.

In cases of pure fever, opiates in certain stages are no doubt of essential service; but, since my attention was roused to the danger which may attend even their cautious use, I have made it a rule always to administer them in divided doses, and to watch their operation narrowly. Even when the fever is combined with peritonitis, however, it would appear that they require to be used with greater caution than I had supposed. I intentionally left with the patient only four grains of opium, in order that no mistake might be committed, by giving a larger quantity than I thought safe, and I gave the strictest orders that the pills should be instantly stopped if head symptoms made their appearance. I believe I should have added that their use ought also to be suspended if the abdominal pain ceased.

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* See Cusack and Stokes in Dub. Hosp. Rep., and in Dub. Med. Jour. &c. &c. on this subject.

As to the other parts of the treatment in this case I shall only remark, that I preferred using enemata to purgatives for two reasons, 1*st*, because they allowed the use of opiates at the same time; and, 2*dly*, because I believe that it is often not only useless but pernicious to purge patients labouring under peritoneal inflammation. Indeed, I have frequently had occasion to verify the remark I have heard made by Dr Alison, that, in peritonitis, opiates are often the best purgatives,—evidently because they subdue the inflammation, and allow the bowels to resume their accustomed action.*

I shall conclude these cases by mentioning a few observations which I have made confirmatory of the view which I took, in the 114th No. of this Journal, of the pathology, &c. of the dropsical affection which succeeds scarlatina.

I have examined the urine in upwards of sixty patients, principally children labouring under this affection, and in only two of these have I found it not coagulable when heated. Both were very slight cases. Indeed, I may say the patients were rather leucophlegmatic than anasarcous. In one of these, six weeks had intervened between the existence of the primary fever and the occurrence of anasarca. In this patient, the density of the urine and its colour were also natural, but it was made in smaller quantity than usual. The density of the urine in the other was 1010 when the leucophlegmatic appearance was first observed. It afterwards, during one day, fell as low as 1005, but soon rose to its natural standard. There was some heat of skin and frequency of pulse in the latter patient; in the first there was no general disturbance. In several cases the coagulability was so great, even when the urine had no tinge of red in it, that the albumen collected upon the top of the fluid resembled the white of an egg when boiled.

The low density was generally the first circumstance that indicated the approach of the disease; in some patients this occurred without anasarca following; but I have never seen the density lowered at the same time that coagulability existed, without these being succeeded by more or less anasarca. As the urine became less coagulable, the density sometimes decreased, but generally, probably because the state of the patient was at the same time improving, as the coagulability became less the density increased. When the quantity of urine passed was very great, it has seemed to have a sensible influence in lowering the density; but I have also repeatedly noticed, in dividing what was passed during twenty-four hours into three or four equal portions, that the largest portion had also the highest density.

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* On this subject, see also Gooch on the Diseases of Females, &c. &c.

The bloody colour of the urine generally appeared early, and in less than ten days was mostly succeeded by a brownish colour, resembling moss-water, or a light-yellow with a slight tinge of brown in it. In one instance the persistence of the red colour was remarkable. As there are several interesting circumstances connected with this case, I shall mention a few details.

The patient, James Mathews, a young man, aged 15, was under the care of Dr E. Gairdner and Dr Home of Edinburgh, by whose kindness I was permitted to observe the progress of the disease. He had been ill with scarlet fever on November 28; he became anasarcous on December 16; and on December 28, the urine, which had been of a dark-brown colour, became bloody. It continued to present the same appearance till January 20th, when I first saw him. At this period there was hardly any anasarca, but his face had a pale waxy appearance, which is very generally observed in different stages of this disease. The urine was made in good quantity, and looked like pure water mixed with blood. It was coagulable, and its sp. gr. was 1014. He had cough, and the mucous and sonorous râles were heard extensively over the chest. In a few days the chest complaint became aggravated, but the urine presented the same appearance, was always coagulable, and made in good quantity, and never rose higher in density than 1015, nor fell below 1012, until January 29th, when he died.

On dissection, the *bronchi* were found generally much inflamed, a considerable portion of both lungs was engorged with serum, and a small part was hepatized. The kidneys were very much enlarged, and were somewhat softer than natural. The external surface was much mottled and altered in appearance, and the tubular substance was more encroached on than in any other instance of this affection I have seen. I got a drawing made within a few hours after obtaining this kidney; and upon looking at it, every one who has seen Dr Bright's plates, at once recognizes its similarity to some of the most marked specimens of the early stage of the peculiar disease which he has described.

I have seen in my own practice and in that of my friends, thirteen cases in which this degeneration of the cortical substance of the kidney has been well marked. Where the disease has been slight or of short continuance, and where the patient has been cut off by some complication, the alteration has been less evident. In a case where no anasarca had appeared, but where the urine had become nearly wholly suppressed for more than twenty-four hours, the patient was carried off from great inflammation and swelling at the angles of the jaws. I obtained just sufficient urine to ascertain that it was not coagulable. On dissection, the cortical substance of both kidneys was found of a reddish cream-colour; and on one extremity of one of them there were several apparently inflammatory elevations, which were found, on making a section of the kidney, to extend about a line into the cortical substance. I have little doubt, that, had this patient lived for a few days longer, anasarca would have appeared; but whether such an inflammatory appearance of the kidney as here presented itself is common, at the commencement of the disease, I cannot of course pretend to say.

The more of this complaint I have seen, the more I am inclined to think that its occurrence is greatly favoured by a pre-existing constitutional tendency. The instances in which I have seen two in the same family affected by it are very numerous. In one instance this constitutional liability to it was very well marked. Four children, residing in the same house, had the primary fever. Three of these were sisters, but the other was not related to them. All the three sisters, who were of a scrofulous habit, became anasarcous, while the other child escaped. The desquamation of the cuticle, I am confident, has not, as has been thought, any marked connection with the anasarca; for I have in numerous instances seen anasarca occur where this had not taken place; and, on the other hand, the desquamation has been very great where anasarca never appeared.

The number of complications which occurs, and the rapidity with which these run their course while anasarca prevails, is most remarkable. In a boy three years old, who was under my care with anasarca, erysipelas of the lower eyelid and suppuration of the lachrymal sac took place. In two days *fistula lacrymalis* was formed, the bones became carious, and the integuments in the neighbourhood were undermined to a surprising extent. While this was going on, the boy was seized with a dysenteric affection, which brought on large evacuations of blood, and two days before his death his body was covered with a petechial eruption. Death in this boy took place within eight days from the appearance of the anasarca.

In regard to the treatment of this affection, I have little to add to what I formerly stated. Where the circumstances of the case have not been peculiar, I have uniformly found the antiphlogistic plan of treatment the most successful. In order that I might be able to attack the disease with greater success, I have thought it my duty for some time after the primary fever has declined, to examine the urine daily, and I have in most cases, by this means, either from diminished density, or from its becoming coagulable, been able to discover the approaches of the disease some days before the anasarca occurred. Whenever these premonitory signs were well marked, I bled the patient freely generally, and also either by cupping or with leeches on the loins; and whether it was that the treatment I adopted had more effect when put in practice at this early stage, or that the virulence of the epidemic, during the prevalence of which I saw most of these cases, had abated, I cannot say; but this I can safely assert, that the complications latterly became fewer and less violent, and the affection altogether much more tractable.

ART. III.—*Illustrations of Practical Medicine.* By JOHN SCOTT, M. D., Fellow of the Royal College of Surgeons, Edinburgh.

1. *OBSERVATIONS on Irritable Uterus.*—Dr Gooch, in his excellent "Account of some of the most important Diseases of Women," has given a very interesting description of a disease which he denominates the irritable uterus; a painful and tender state of that organ, neither attended by, nor tending to produce, change in its structure.

He considered it at first to be chronic inflammation which would end in disorganization probably of a malignant kind. But experience, which taught him that it was a very intractable disease, taught him also that it was not a disorganizing one; for he states that he has known cases which lasted upwards of ten years, in which the structure of the uterus remained unaltered. The symptoms are stated to be, pain in the lowest part of the abdomen, along the brim of the pelvis, often also in the loins. The pain is aggravated by the erect posture; but the recumbent position alleviates, but does not remove the pain, which is always present more or less. The paroxysms generally come on a few days before menstruation, or, as in many cases, a few days afterwards, but it occurs at this and at other times, though the patient has been recumbent for a long time. On examination, the neck of the uterus is found to be exquisitely tender, and slightly swollen, but this symptom, as well as the degree of pain felt on touch, varies at different times. The menstruation often continues regular, but sometimes it is diminished, or ceases altogether. There is little general disturbance of the system. To embody the symptoms in one view, "let," says Dr Gooch, "the reader fancy to himself a young or middle-aged woman somewhat reduced in flesh and health, almost living on the sofa for months, and even years, from a constant pain in the uterus, which renders her unable to sit up and take exercise."

Dr Gooch states that he always found it a most intractable disease, very slow in the progress of recovery; and no disease is more liable to relapse. He mentions that Dr Baillie had known one patient who had laboured under it for thirty years.

The treatment which Dr Gooch proposes is total repose, local blood-letting by leeches, and cupping, and, if the constitution participates in the affection, bleeding from the arm; but this he was cautious about; narcotics to relieve the pain, and gentle laxatives, the warm or steam-bath, or hip-bath. Should these means fail, a gentle course of mercury and external irritation were recommended. The practitioner can do no harm, he says, and must do good as long as he confines himself to the recumbent position, warm hip-bath, and unirritating aperients; but with blood-letting and mercury he must be more cautious. The result of Dr Gooch's experience is not very satisfactory, as in almost all his cases the recovery was slow, and in some the disease was only alleviated.

As to the nature of the disease, he considers it neither as acute nor chronic inflammation, as it does not alter the structure of the organs. He regards it as something of a nervous affection, resembling a state to which other organs are subject to, and which in them is considered as irritation, resembling what surgeons call an irritable tumour of the female breast.

I have been more particular in stating Dr Gooch's opinions, as he was the only English author when he wrote who had described this affection, and because, with all due respect for that excellent author's talents and opportunities, I have been led to differ somewhat from his view of this affection. Of the accuracy of his description there can be no doubt; but from what I have seen, and especially from one case of peculiar severity which has been under my charge for some years, I am inclined to think that Dr Gooch insists too much on its nervous character. The treatment found effectual in his hands was local blood-letting and antiphlogistic remedies; but, by considering it as irritation rather than inflammation, too much room may be given for dilatory and vacillating practice.

The case alluded to is the following. A newly married lady had suffered from irregular and scanty menstruation, with slight leucorrhœal discharge for some months, when I was consulted regarding her health. The symptoms were attributed to a stumble when going down stairs, which was followed by a flow of blood from the parts. She was of a full habit of body, and had previously enjoyed good health. Leeches were repeatedly applied to the ankles; pediluvia, warm hip-bath, mild laxatives, and low diet, were recommended. Little or no benefit was derived from this treatment for some months. A few days before a menstrual period she was seized with intense pain in the uterine region, so severe as to occasion constant agitation and restlessness. The pulse was little affected. On examination, the neck of the uterus appeared quite healthy, perhaps a little longer than usual, and gave a sensation of increased heat and turgescence. The examination did not increase the pain, but she said it was already so great that nothing could add to it.

She was cupped on the sacrum, and leeches applied to the groins and labia with little relief. I may mention, that, from a peculiarity of skin, very little blood flowed from the leech-bites, and it was even difficult to obtain a sufficient quantity of blood by cupping. An examination was made by an eminent accoucheur, who could discover no trace of disease. The paroxysm continued for two days and then subsided. On its recurrence another physician was consulted, and we agreed as to the plan to be followed, which was absolute rest in the recumbent position, occasional cupping, and the application of leeches to the labia every fourth or fifth day, low diet, and opiate and emollient injections. This was persevered in for some time, but the paroxysms continued as severe as ever.

The menstrual discharge was scanty, and generally preceded by a brownish fluid. The paroxysms of pain were sometimes previous to, at others after, the menstrual period. They usually lasted three days, and although they remitted during the day, they continued very severe all night. The expression of pain was as severe as I ever recollect of witnessing. She complained of a hot burning searing feeling in the passage,—a feeling as if something hard was pushing against the womb. There was sometimes bearing down, at others a sensation as if something were tearing the diseased parts asunder. The severe fit usually terminated by a discharge of bloody fluid.

Blood was several times drawn from the arm, but without any effect. Blisters were applied, and a seton inserted in the back. The vapour bath was also tried; but the only relief that could be obtained was from large doses of muriate of morphia, which induced a kind of stupefaction. The other preparations of opium were tried, but the muriate was found to answer best. *Stramonium, conium*, and *hyoscyamus* were also given; but we were usually forced to return to the morphia. After the subsidence of a severe paroxysm, pain still continued, but with less intensity. There would probably be severe pain for some hours in the morning, when it would subside and return again towards night. It was always increased by the erect posture. Mercury was given so as to affect the mouth, and the effect kept up for six weeks; in fact, every thing that Dr Gooch has recommended was had recourse to, and submitted to with admirable perseverance by the sufferer. Copaiba, cantharides, &c. were tried at different times. Dysuria also came on to a great extent, with pain in the bladder, which led to an examination of that organ, but without result. There was now occasional leucorrhœal discharge, which was sometimes yellow, sometimes colourless, and sometimes dark-coloured. An eminent physician occasionally saw her; but all our efforts failed in producing any alleviation.

The disease had now continued more than two years and a half, during which time she had been confined to the recumbent position, and lived in a state of extreme suffering. There was some emaciation but not great, but there was a delicacy of complexion. She complained of blindness, with dilated pupil, and some nervous symptoms, which threatened eventual serious consequences.

It was now deemed expedient, for the recovery of the patient, to employ the speculum. The uterus was of its natural size, but the vaginal covering of the neck and the vagina surrounding it, was of an intense red, while coloured mucus was observed flowing from the *os uteri.* Portions of the vagina were also of colours varying from brownish-black to bright red, rather in lines and patches than continuous, very much resembling inflammation of the mucous membrane of the intestines. On one part there was a patch of superficial ulceration or rather abrasion surrounding the urethra; it appeared as if the external covering had been removed, and it was surrounded by minute vegetations.

In this state of the uterus and vagina, I conceived it proper to recommend depletion as direct as possible from the parts; and leeches to the number of ten were accordingly applied to the uterus and vagina. They gave no pain, filled themselves in a few minutes, and the discharge of blood was copious. This was followed by great abatement of pain. The leeches were repeatedly applied at intervals of a week, or even shorter periods, whenever the pain threatened to return. From eight or ten were usually applied at once. The number of times they were had recourse to, I cannot precisely state, but certainly more than a dozen times, and each application was made according as the symptoms seemed to require it Lunar caustic was repeatedly applied to the ulcers. The dysuria still continued with pain in the bladder for two or three hours in the morning; but it yielded on giving ten drops of the tincture of muriated iron every ten minutes till relief was obtained. It seldom required more than three doses, and so well-marked were the effects, that, when not given, the pain and inclination to pass urine continued for two or three hours; when given, it yielded in twenty or thirty minutes.

In conclusion, the pain disappeared, and the patient was sent to the country, where she recruited gradually. The menstrual discharge returned, but is still rather scanty. There has been no return of pain, and she is now able to move about and take moderate exercise.

Since the above was written, I observe that Dr Davies, in the seventeenth number of his Principles and Practice of Obstetric Medicine, has taken a similar view of Dr Gooch's irritable uterus to what I have done, and has related two cases which he treated on a similar plan to that I followed. Dr Davies' cases were not so severe as the one here related, but they confirm the opinion that inflammation, or at least vascular fulness, ought to be suspected in the treatment of this severe affection.

The practical conclusions I would draw are, that the state of the lining membrane should always be kept in view; that, as long as the pain continues, and the strength remains unimpaired, we should never despond, but persist in employing remedial means, and that the detraction of blood from the uterus itself should be had recourse to when other means fail.

2. *Case illustrating the Anomalous Nervous Symptoms occasionally induced by Tænia.*—The following case appears to me curious and instructive in two points of view; *first*, as to the deceitful nature of the symptoms, and, *secondly*, as to the remarkable nature of the mental phenomena, depending on a cause which was subsequently ascertained and removed.

In the spring of 1830, I was requested to visit James Simpson, a pastry-cook, residing in Rose Street. He had been labouring under symptoms of disordered stomach for a year and a-half, and for the last nine months of that period the disease had assumed a serious form, he having been constantly affected with vomiting about an hour and a-half after taking food, whether it was solid or fluid, unless in the very smallest quantity. He was also, from his wife's account, liable to fits, the nature of which I could not ascertain from her description. He had been under a most respectable practitioner during the whole period, and used a variety of means without benefit.

The colour was sallow and unhealthy; the skin clammy; pulse soft and natural; some emaciation, but not to a great extent, or in proportion to the excessive weakness of which he complained; bowels very irregular, usually constipated; constant feelings of pain and gnawing in the epigastrium; not much increased on pressure. Different medicines, chiefly of the laxative kind, were used, when a smart attack of bowel complaint came on, during which a considerable quantity of blood, mixed with feculent matter, was passed, and then the vomiting ceased; the uneasy feelings disappeared, and he considered himself as well.

In about two months afterwards I was requested to see him again, when I found that the vomiting after food had returned, and that the bowels had become very constipated. He complained of pain over the whole head, which was particularly intense on the fore-part, increased by light and motion; the pupils were contracted; the pulse 92, full and hard. There were intervals of ease, and he had occasionally a quiet but short sleep. Laxative medicines were givên, and blood taken freely from the arm, with instantaneous relief, although of short duration, for next morning the pain was as severe as ever.

A friend saw him with me, and we were somewhat puzzled whether to consider it as inflammation of the brain or not, but considered it prudent to repeat the bleeding. The appetite was gone, great thirst, but the liquid taken was immediately vomited. His wife said the fits had returned. It is unnecessary to enter into long details. In a few days the pain in the head was somewhat mitigated, though he still complained much of it. It was in visiting him early in the morning that I first witnessed what were called his fits. He lay in his bed with his eyes open and directed upwards. When I inquired how he felt himself he did not look at me, but replied, " Quite well,—there is nothing the matter with me."—" How is your head?"—" Quite well." " No pain?"—" No."—" Any sickness?"—" No." The pulse was calm, and about ten beats lower than usual. When conversing with him he suddenly rose up in the bed, gave a long yawn, stretched out his arms, gazed at me for a moment, and then put his hand to his head, and complained of the pain in it.

A few days afterwards I found him dressed by the fireside, and scolding his wife for some alleged fault. When I inquired what the matter was, he said he had been very ill used, and that he had dressed himself to go and complain to Dr Scott, and entered into long details, addressed to me as a third person, perfectly unconscious of my presence. The eyes were not directed to me but straight forward; and he always said he was quite well. On starting from this state, which was almost instantaneous, he complained of his head; the vomiting still continued; and he had constant gnawing feeling in the epigastrium. I tried a variety of means, and witnessed several of the attacks; and there was one remarkable circumstance connected with them, that when awake he could scarcely be persuaded to take food of any kind, while in his unconscious state he complained bitterly that his wife had been starving him, and would give him nothing to eat, and when food was offered he took it eagerly. His natural sleep was rather sound, and he awoke in the usual manner; but generally in the morning relapsed into the fits of unconsciousness, which continued from ten minutes to a quarter of an hour, and sometimes half an hour, and recurred three or four times a day. When questioned as to his sensations, he professed his utter unconsciousness of having been spoken to, or of my presence. Previous to his waking he frequently rose from his bed, dressed himself, walked about, and was with great difficulty prevented from going into the streets, generally for the purpose of visiting me. It now occurred to me that these strange appearances might be connected with worms, I therefore gave him a full dose of turpentine followed by castor oil, which brought away many pieces of *Tœnia solium* with much mucus. The dose was repeated several times, the worm discharged and all the symptoms disappeared. He has had frequent returns of sickness, and other indications of his former disease, but these have been invariably removed by turpentine or decoction of the pomegranate root, and followed by a discharge of pieces of worm. For the two last years he has been perfectly well.

ART. IV.—*On Uterine Leucorrhœa.* By F. CHURCHILL, M. D. Licentiate of the King and Queen's College of Physicians in Ireland, Physician to the Wellesley Female Institution, Lecturer on Midwifery and Diseases of Women and Children at the Medico-Chirurgical School, Digges Street, Dublin.

THE first question which presents itself to the mind of the practitioner when consulted upon a case of "Whites" or "Leucorrhœa" is, of course, whether it results from an organic disease of the uterus, or from a morbid secretion of the lining membrane of the genital canal? A careful investigation will in most cases decide this question satisfactorily; but suppose there be no *organic* disease, there remains still another point of considerable interest and importance, viz. what part of the membrane lining the genital canal is the seat of this disease? It is interesting, as an example of the pathological law, that the characteristic developement of a disease depends not merely upon the tissue affected, but to a certain extent upon the *subjacent* organ; and it is important, because the treatment, which is nearly always successful in vaginal leucorrhœa, is useless, to say the least, in leucorrhœa from the lining membrane of the uterus.

The supposition of an increased morbid secretion from this part is no novel idea, as will appear from the quotations I am about to make; but whilst each author has more or less cursorily alluded to this variety, few or none have followed up the investigation rigorously; and it is with the hope of contributing something to the history of this disease that the present sketch is undertaken.

Avicenna and Savanarola supposed the whites to be derived from the veins of the uterus. Sylvius, Cullen, Leake, &c. from the vessels which secrete the menses.

Bonnet, Dolæus, Schneider, Morgagni, Riofrey, &c. &c. attribute it to the lining membrane of the uterus and vagina.

Baglivi says, (Prax. Med. Lib. ii. ch. viii.) "Si vero durante menstruatione, fluor albus evanescat et eodem finito, denuo regrediatur, pro certo habeas, mulierem fluore albo *uterino* laborare. Cætera signa fallunt, hoc verò constans est et mulierum dolum aperté deludit."

Astruc describes a species of whites occurring periodically in chlorotic females, as a kind of substitute for menstruation, and which is also met with in others commencing a few days before, and persisting some days after menstruation.

Gardien and Capuron suppose it to proceed from the lining membrane of the womb; and, indeed, with most French writers the word leucorrhœa is restricted to this meaning.

Blegny found a quantity of whitish fluid in the uterus of a female subject to whites.

Blattin found the discharge to proceed from the uterus in nine cases out of twenty-four who died suffering from leucorrhœa.

Nauche describes very accurately some varieties of "*catarrhe uterin*," or uterine leucorrhœa, principally those connected with menstruation.

Denman mentions, that it may proceed from either the uterus or vagina, and that the fluid may be either the natural discharge increased in quantity, or an acrimonious secretion.

Burns remarks, that when it proceeds from the womb, it often interferes with menstruation, and prevents conception. "Very frequently, however," he continues, "the menses do continue pretty regularly, and in those cases the whites disappear during the flow of the menses; but it is increased for a little before and after menstruation. When the menses are obstructed, it is not uncommon for *flour albus* to become more abundant, and to be attended with more pain in the back. About the menstrual period, Hamilton speaks of a variety of 'sexual weakness,' in which there is a greenish or brownish discharge, greater in quantity before and after menstruation, which is itself irregular in quantity or colour, or in both. Patients labouring under this are often barren."

Sir C. M. Clarke does not distinguish between uterine and vaginal leucorrhœa, though he mentions having found the uterus and liver enlarged in women who have died during the progress of this disease.

Jewel, in his able treatise on leucorrhœa, says he believes the discharge "seldom issues from the uterine cavity." He gives some directions, hereafter to be noticed, for distinguishing it when it does proceed from thence.

Bow and Duges, in their recent work on Diseases of the Uterus, &c. allot a chapter to the description of Uterine Flux, and Duges has written an article upon it in the Nouv. Diction. de Med. et de Chir. Pratiques. They divide it into two species, subacute and chronic; but they appear to me to make but little distinction between it and vaginal leucorrhœa.

We may therefore look upon the distinction of uterine from vaginal leucorrhœa as established; and I shall endeavour, from the sources already quoted, and from numerous observations made by myself, to give a connected view of the disease.

As, however, the varieties alluded to by authors are much fewer than we might expect, and constitute a much smaller proportion of the cases of whites than is really the case, I shall, before proceeding, enumerate those species which have presented themselves to me at the dispensaries with which I have been connected.

The circumstances, then, under which I have observed what appears to me to be uterine leucorrhœa, are,

1. In young females of a delicate habit, especially if a consumptive diathesis prevail in the family. Before the establishment of regular menstruation, it is not uncommon to have one or more monthly discharges of whites, with more or less of the symptoms of menstruation. I was consulted some time ago by a lady, whose daughter, aged 17, had some symptoms betokening the approach of menstruation; but all she observed for two periods was a whitish discharge from the vagina, without irritation, which ceased in two or three days. At the next period, however, the menses appeared. Two days ago I visited a case precisely similar. There can be but little doubt that the fluid proceeds from the uterus in these cases; and I need hardly say that the occurrence is a favourable one.

2. In chlorotic patients at the menstrual periods. I saw a young female labouring under this complaint, who for a long time excreted nothing but a white discharge at the menstrual periods.

Nauche mentions a similar occurrence in a healthy female, aged 22, which continued some years. The discharge lasted eight days each time, and then ceased.

3. When the menses are suppressed, it is not uncommon to find the next period marked by a leucorrhœal discharge.

4. When the menses are in excess, or mixed with blood, the white fluid often continues to flow during the interval between the two monthly periods.

5. The catamenia may be natural, and the patient suffer from leucorrhœa during the interval, the white discharge *being frequently increased a few days before, and generally some days after*, the subsidence of the menstrual excretion, or the leucorrhœa may exist only for a few days before and after the catamenia.

This is the more common variety of uterine leucorrhœa. Not a week elapses without several such cases presenting themselves at the Wellesley Dispensary; and in this class of cases the symptoms are better marked, as they generally exhibit the effects of a long continuance of the disease. In them, too, is seen greater variety in the nature of the discharge, and these are the examples in which the function of conception is most frequently affected.

6. After child-bearing, when the lochia, as to their distinctive characters, may be said to have ceased, an inodorous white discharge, producing no irritation, continues for a month or six weeks; or, in women confined for the first time, we may observe at the termination of the first, and more frequently of the second, month after delivery, a sudden flow of whites. Menstruation may or may not be established afterwards. I was called to see a patient the other day in whom it occasioned considerable alarm from supposed disease of the womb.

7. After abortion, especially if repeated, on the cessation of the coloured discharge.

It is well known to all accoucheurs that women subject to abortions are very liable to attacks of this kind.

These include, I think, all the circumstances under which I have observed this disease. I have endeavoured to exclude all where a doubt could be fairly entertained as to the source of the discharge. At the same time I admit, that in any of these cases vaginal leucorrhœa may possibly coexist, though in some the probability is small, and in all the presence of the uterine affection modifies the symptoms, and renders the diagnosis possible on close investigation. I shall now enter more minutely into the history of the complaint.

Uterine leucorrhœa consists in a morbidly increased discharge of fluid from the lining membrane of the womb, varying somewhat in its physical characters. It may be divided, like vaginal leucorrhœa, into acute and chronic. It is, however, foreign from my purpose at present to enter upon the consideration of the former, both on account of its greater rarity, and because it presents a very different developement from the chronic attack, which we are frequently called upon to treat.

Chronic uterine leucorhœa may attack females at any period from puberty to old age. If it prevail more at one period than another, it is probably about the cessation of the menses. It appears also in women of every temperament, according to the peculiar cause. The lymphatic, in whom the uterus appears unable to excrete the red particles of the menses, or in whom, from constitutional causes, the vessels of the mucous membrane of the uterus appear to be in a state of unusually active secretion;—the plethoric and robust, in whom the circulation, active generally, is peculiarly so in the generative organs, during their period of activity;—and in the melancholic, whose mental associations so often aid in the aggravation of what was originally a trifling complaint.

The *causes* are so numerous that I shall do little more than enumerate them.

Deficiency of secretive energy; debilitated constitution; suppression of the menses, though it is difficult sometimes to decide whether this is a cause, or the effect of the same cause which produced the amenorrhœa; abuse of coition, especially in the cases connected with menstruation; too stimulating diet. Wine has produced it in those unaccustomed to drink it, according to Dugès; fatigue and deficient nourishment; local or contiguous irritation, as a pressing on the vagina, or ascarides in the rectum; frequent abortion or child-bearing; certain localities, or atmospheric changes (Nauche); cold and fatigue; constipation (Boivin and Dugès); over-sucking; depraved imagination; sedentary employment (Dugès); scrofulous habit (Nauche); use of emmenagogues; suppression of eruptions (Nauche, Dugès), &c. &c. are amongst the most frequent and well ascertained causes.

In the more recent cases, the *symptoms* are mild; there is but little distress; some languor; occasional weakness in the back and loins; a headach now and then; the complexion a little paler than natural, with a degree of moisture unusual about the external parts of generation, is all that is to be observed.

In more aggravated cases the patient complains of great debility and unwillingness to exert herself; an aching sensation, or even pain, in the back; or rather, if accurately questioned, midway between the sacrum and pubis (*i. e.* in the uterus); a feeling of weight in the pelvis, and occasionally of bearing down; flushes of heat over the body; the pulse generally small, and rather quicker than natural; the skin yellow or greenish, flabby and moist, often hot; while the eyes are surrounded by dark areolæ. The headachs become more frequent and severe, though without evidence of vascular excitement; and I think I have observed the pain generally toward the back of the head.

Vertigo and fainting are not uncommon, and we may often observe pain under the left breast.

The tongue is seldom dry or furred; generally of a yellowish red colour, flabby, and indented by the teeth. (Marshall Hall).

The appetite diminishes and becomes fastidious, torpor of the bowels occurs, with deficiency of hepatic secretion. (Clarke.) We may sometimes notice an eruption (*Acne punctata*, or *A. rosacea*,) in different parts of the face.

An examination *per vaginam* discovers occasionally, though rarely, a slight enlargement of the body of the uterus, with but very little if any tenderness on pressure; and the *os uteri* rather more open than natural. More generally, however, no information at all is gained by this procedure.

The discharge varies in quantity, being often so profuse as to oblige the patient to wear a napkin. It is generally slightly opaque, but may vary in colour. It has been observed of a faint green or brownish hue. (Hamilton). It differs in consistence too from being thin and watery, up to the jelly or curdled fluid described by Hamilton and Nauche.

It occasionally appears of an acrimonious nature, since it causes *pruritus* and slight excoriation of the *labia;* and it strikes me as probable that these may be the cases which give rise to inflammation of the male urethra after cohabitation, and which so much resemble venereal infection.

The duration of the disease is variable. The cases connected with menstruation are generally the most prolonged. It may cease spontaneously, after running a certain course, or it may be terminated by the skilful application of remedies.

Pathology.—From the constitutional character of many individuals thus affected, it has been supposed, in common with vaginal leucorrhœa, to originate in a state of debility. We know, however, that many local diseases of excitement are accompanied with general depression, and this seems to be amongst the number. From the local distress, from the increased secretion, and from the remedies most successful, I feel little doubt that it is a chronic inflammation, of variable intensity, of the membrane lining the uterus.

As to the identity of the vessels engaged with those which secrete the menses, it is difficult to give a decided opinion. In some cases it appears highly probable.

I know of no guide in our *diagnosis* of uterine leucorrhœa from uterine gonorrhœa, unless that in the latter there is said to be a sense of burning pain along the genital canal, with a puriform discharge, and scalding on making water, and the attack is much more acute.

From vaginal leucorrhœa it may be often distinguished by the circumstances under which it occurs, as after abortions, before menstruation, &c. &c. or by its peculiarities at the menstrual epochs, and its greater effects upon the constitution. A definitive test has been proposed by the older writers, and repeated by Jewel, on the supposition, that, if the discharge only escapes from the uterus, a piece of sponge introduced into the vagina would be stained only at its upper end. This test does not appear to me so conclusive; for if the discharge be great, the sponge would absorb much more than the quantity sufficient to mark its source. The tenderness on pressing the *cervix uteri*, with the white colour of the discharge in inflammation of the glandular apparatus of the neck of the uterus, as described by Sir C. M. Clarke, will, in most cases, distinguish that disease from the one under consideration.

The *prognosis* is favourable, and of slight importance, except as the question of sterility may be involved. Authors are generally agreed that an excess of the severe form of leucorrhœa (*i. e.* uterine) precludes conception. The cases are probably those connected with menstruation.

Treatment.—I mentioned at the commencement of this paper that the use of injections, so successful in vaginal leucorrhœa, generally fails in this species. It was this circumstance which first directed my attention to the distinction between them.

I found several cases much aggravated by the use of injections of nitrate of silver. This I can only explain on the supposition that the disease is modified by the subjacent uterine tissue. It is fair to mention, that, in this particular, the experience of Boivin and Dugès is opposed to mine.

The treatment must be varied according to the constitution of the patient, and the standing of the complaint.

The plethoric may be benefited by a slight loss of blood, either from leeches applied to the vulva, or by cupping over the sacrum. The latter is preferable for many reasons.

With the generality of patients I have succeeded better by applying blisters to the sacrum, and either renewing them, or keeping up the discharge for some time, along with the internal use of balsam of copaiba in augmenting doses. If the patient be weak, tonics may be necessary; and sulphate of quinine is the best, or iron if the discharge be vicarious of menstruation.

Uva ursi, catechu, gentian, rhatany, &c. have been recommended by different authors. Nauche speaks highly of aromatics. The chalybeate waters would probably be very useful.

The state of the bowels should be closely attended to. I have found great advantage from the exhibition of equal parts of aloes and assafœtida once or twice a-day.

Conium, hyoscyamus, or opium, may be given should there appear much local or general irritation.

Cleanliness is of the utmost importance. The external parts should be washed with tepid water twice or thrice a-day; and, should there be pruritus or excoriation, the addition of acetate of lead will be found useful.

The patient should be comfortably, yet not too warmly, clothed, especially about the pelvis.

Air and exercise are of great benefit, but should so be taken as to avoid any irritation of the organ affected. In some cases sea-bathing may be of use. It is scarcely necessary to say that any known cause should be sedulously removed. In most cases it will be requisite for the patient to live *absque marito* for some time.

104, *Stephen's Green, South, July* 10, 1834.

ART. V.—*Relation of the Autopsy of a case of Chronic Empyema, attended by general Ossification of the left Pleura.*

By JOHN THURNAM, M. R. C. S. L. Wymondham, Norfolk.

WILLIAM JONES, aged 29 years, residing at 11, Great Earl Street, Seven Dials, London, died on Wednesday morning, May 14th, of the present year, under the following circumstances.

On the previous Monday he had been in a state of intoxication, and had been fighting with one of his associates. During the following night he was exposed to the rain and cold in a neighbouring privy. The next day a difficulty of breathing, to which he had been long subject, increased, and, being attended with some expectoration of blood, on the following morning he died, without receiving any regular medical assistance.

On Friday the 16th, I was requested to examine the body, which, having the assistance of my friend, Mr Thomas Davies of Chester, I proceeded to do sixty hours after death. Externally, the body appeared to be that of a stout well-made man, and did not present any marks of violence or deformity. On opening the chest, we found that the heart was situate on the right side, its apex having a nearly similar relation to the fifth and sixth ribs, which in its normal situation it possesses to the same bones on the left side. It was now observed, that whilst by sawing through the ribs and everting the sternum, the cavity of the pleura had as usual been exposed on the right side,—this was not the case on the left, and that the *pleura costalis*, or some structure occupying its situation, had become the seat of a continuous ossification. The saw had cut through this to the extent of about two inches, and through the fissure thus made a little brown pultaceous fluid was oozing. The pleura, distended by its contents, occupied the whole of this side of the chest, and even protruded beyond the median line, thus pushing the pericardium and heart into the situation before described, and compressing incommodiously the right lung. In dividing with the scalpel, the upper and anterior part of the pleura to a small extent, it gave the sensation of cutting a cartilaginous cyst plentifully studded with osseous matter,—in fact, it resembled the structure of the cysts met with in some cases of osteo-sarcoma.

Having made an opening into the pleura, of sufficient size to admit a large cup, we found that its cavity was filled with the same dark chocolate-coloured thick fluid, before alluded to, which had the consistence of thick pus, wanting, however, the viscidity of that fluid, and somewhat resembling the matter occasionally met with in the cavities of a diseased ovary. The quantity of this fluid amounted to between seven and eight pints. This having been removed, the whole of the lung was found compressed against the vertebral column, and not larger than the healthy spleen, having lost its healthy organization; and somewhat resembling that viscus in its density and general appearance.

I now proceeded, in the best way I was able, to dissect the whole of the pleura from its attachments to the ribs and diaphragm, which was comparatively readily effected, for the cellular tissue was in these situations lax, and easily divided either by the scalpel or fingers. In this manner I succeeded in removing it entire from the chest, and had an opportunity of washing and examining it more minutely. Externally, it presented the appearance of a large ovoid fibro-cartilaginous cyst, (the bony matter being obscured by the thickness of this structure,) reminding one of nothing more forcibly than the appearance presented by a diseased ovary; its thickness varied in different parts from an eighth to a quarter of an inch. Internally, its surface was very irregular, presenting numerous concave patches, of greater or less extent, which appeared to be projections of the general structure of ossification pervading almost the whole of the membrane. The internal surface did not appear to be covered by a serous membrane, nor by any remains of one, but had a brown liver-like substance spread over it, which would appear to have been deposited by the fluid with which the cavity of the pleura was filled, and to have consisted of its denser particles, it could be peeled off, something like the laminæ of an aneurismal clot. This matter was more abundant on the small remaining surface of the *pleura pulmonalis* than elsewhere, but in this situation the ossific matter was less largely deposited than in the *pleura costalis.*

Upon examining the right lung, its bulk was found somewhat diminished from the encroachment of that of the left side. The pleura itself was neither thickened, adherent, nor otherwise altered; but the lung itself was considerably congested, and its vessels having apparently given way in several places, the blood had become more or less extravasated, and it presented the appearance of that condition called by Laennec Pulmonary Apoplexy.

Nothing remarkable presented itself in the examination of the heart or large vessels, nor of the abdominal viscera.

Neither the head nor spine were examined. I succeeded in obtaining permission to take the ossified pleura, and having prepared it in the dry form, it constitutes a specimen of ossification of that membrane, unequalled, so far as I know, or have been able to learn, in the various descriptions of those who have written on the subject.

I naturally felt inquisitive, from the remarkable appearances met with on dissection, to obtain as correct an account as possible of the previous state of the man's health; and, with considerable trouble, I succeeded in making out from his friends the materials for the following imperfect history.

He was a fine healthy youth, and followed his father's employment, (that of a coach-smith,) until about his 16th year, when he had a severe attack of inflammation of the chest, consequent on exposure to cold, and to some great exertion in lifting the body of a carriage, to the last of which causes his father attributes the illness. He appears to have been at first neglected, but, being treated for it by the parish surgeon, he gradually seemed to get well. It is not recollected whether he was bled for it or no. It seems that there were dissensions existing in the family at this period, in consequence of which he left his father, who heard nothing of him for nearly a year, when he returned with an abscess in the left side, corresponding about to the eighth and ninth ribs, and situate rather nearer the spine than their cartilaginous extremities. At this time he was a patient at the Middlesex hospital, where the abscess was opened, at which time, as likewise at subsequent ones, a large quantity (as a quart or so) of matter was evacuated; and his father says that the ribs were laid bare. His brother informed me that he always called the affection a "lumbar abscess," a name which he probably got from the hospital; for through the kind assistance of Mr Elwyn, the house surgeon to that institution, I find that he was an out-patient there in the year 1824, under the late Mr Joberns, and that the disease was registered as ***Struma.*** They also tell me he was an in-patient at St Bartholomew's Hospital, but whether before or after this I cannot learn.

On his getting better, he was, to use his mother's expression, "left quite an object," his body being very obviously bent towards the affected side, causing him to limp in his gait. This gradually became less obvious, and during the last eight or nine years of his life, there was no perceptible deformity, nor was he supposed to have any actual disease about him, though generally more or less troubled with a difficulty of breathing. His habit was also less robust than it had promised to have been previous to the attack. These circumstances, however, did not prevent him following the laborious employment before-mentioned. The contraction of the chest, which of course had existed, was not observed either by his father or mother.

The very extensive ossification of the pleura being the most remarkable feature in this case, appears to me to merit a little inquiry. The question naturally suggests itself, in what tissue was the ossific matter deposited, and what were the steps which lead to its formation? That bone, or rather that the earth of bone, may be deposited in the subserous cellular tissue, will not, I believe, be doubted. At least I have satisfied myself of the fact, in one specimen of circumscribed ossification of this membrane which I have met with; but that the present is a case of this description I am not ready to admit, but rather regard it to be a case, agreeing in very many particulars, as was kindly pointed out to me by Dr Alison of Edinburgh, with Laennec's description of acute hemorrhagic pleurisy. That distinguished pathologist states, that in this variety of pleurisy the false membranes are not able to assume the functions of a serous structure as in simple pleurisy, after they have once become converted into a fibro-cartilaginous tissue, which change they have a great tendency to undergo, and even to become ossified in *certain points.* He also states that in this variety the effused fluid is in greater quantity, and that "there is less tendency to its absorption."*

Another remarkable feature in the case is the fact of the empyema, after having at one period become almost cured by the evacuation of the matter through an external wound, as evinced by the consequent deformity, having again gradually formed by the secretion of fresh fluid, as appeared upon dissection, and as was marked during life by a concomitant removal of the distortion. It is in the presence of this fluid during so long a period that I should trace the cause of the remarkably extensive ossification, the original tendency to which morbid action was doubtless kept up, and perhaps even increased by this circumstance. The colour and appearance of the fluid likewise comes to support the idea of its having been originally one of the cases of hemorrhagic pleurisy; this being, as I before stated, of a deep chocolate colour, forcibly suggesting the admission from some source of the red globules of the blood. Since its secretion, however, the fluid had itself no doubt undergone a progressive but considerable alteration, partly from the morbid condition of the secernent and absorbent functions of the diseased pleura, and partly, perhaps, from the operation of the mechanical law of gravitation, which I before pointed out as the probable source of the laminated substance on the inner surface of the cyst. From the state of the left lung, it was evident that the function of respiration must have been entirely carried on by the right, which accounts for the speedy manner in which the inflammation of that organ, induced by the operation of the conjoined causes, of excess and exposure to cold, proved fatal.

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* Forbes' Laennec on Diseases of the Chest, 2d edit., p. 430–31.

Art. VI.—*On the Existence of Charcoal in the Lungs.* By Thomas Graham, F. R. S. Edin., Lecturer on Chemistry in Anderson's Institution, and Member of the Faculty of Physicians and Surgeons of Glasgow.

Dr G. Pearson, in a valuable memoir on the colouring matter of the black bronchial glands, which appears not to have received that consideration from physiologists which it deserves, establishes beyond a doubt that a dark carbonaceous matter accumulates to a considerable extent in the glands in question, during the course of life in the human subject, which he thinks is introduced into the lungs with the air in breathing.* The black matter was obtained not from the red glands, but from such only as were dark-coloured, by acting on them indifferently with caustic potash or nitric acid, so as to dissolve or destroy the organic matters. This black matter proved to be a tasteless and infusible powder, insoluble in muriatic acid, nitric acid, and perhaps all common acids except sulphuric; affording as large a proportion of carbonic acid, when burnt, as animal or vegetable charcoal which has been dried at the same temperature, and equally unaffected by heat in close vessels. In fact, although not completely freed from animal matter by Dr Pearson, the black powder possessed all the properties of carbon or charcoal, as we have it in lamp-black or soot.

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* Philosophical Transactions, 1813, p. 159.

Dr Pearson believes that this sooty matter is deposited on the surface of the bronchial tubes and air-vessels from the air inspired; and, from a comparison of the black lines and black net-like figures, many of them pentagonal, on the surface of the lungs, with the plates of the lymphatic vessels, by Cruikshanks and others, which they exactly resemble, he infers, "that the lymphatics of the lungs absorb a variety of very different substances, especially this coaly matter which they convey to the bronchial glands, and thus render them of a black or dark-blue colour. When a thin slice of the surface of the lungs was treated with nitric acid, these black lines remained, as black threads of charcoal, after the solution of the other parts."

In Dr Gregory's well-known case of the universal black discoloration of the lungs of a collier, the carbonaceous matter existing in great abundance in the lungs was concluded to be coal-dust, from an examination to which the serous fluid obtained by pressure was submitted by Dr Christison. The carbonaceous matter was not affected by chlorine and nitric acid, reagents which destroy all known organic colouring matters, and therefore it was not likely to be a secretion; and when submitted to heat, the condensible products which distilled over are said to have been externally similar to, and to have had exactly the colour of, impure coal-tar naphtha.

I have had several opportunities of substantiating the existence of a carbonaceous matter in a state of extraordinary accumulation in black lungs supplied by my medical friends, to which I shall allude in succession.

1*st*. From Dr Cumin, to whose letter of the 1st July 1833 I shall first refer for some medical information in regard to the case.

"I send for your inspection a portion of lung completely infiltrated with black matter, which oozes from it like China-ink. It was taken from the body of a coal-miner, who died on the 27th of June, in a state of such extreme emaciation as I do not recollect ever to have seen previously; having expectorated for nearly four months before his death a black soot-like fluid. My attention was first directed to this peculiar form of phthisis (for such it is) by a series of queries drawn up and extensively circulated early in the present year (1833) by my valued friend, Dr John Thomson of Edinburgh. Never having met with the disease which he referred to, I applied to all my medical acquaintances in charge of coal-miners, but could obtain no information regarding it, except from Dr Marshall of Cambuslang, who, in May last, kindly showed me the case from which the portion of lungs I now send you was taken two days ago. Dr Marshall informed me, that he had previously seen two other cases of the same description, but had not opened either of the bodies. I shall feel much obliged to you, if you will make a chemical examination of the black matter, and ascertain whether it resembles the black animal products, as the *pigmentum nigrum*, the liquor of the cuttle-fish, or if it is an extraneous body admitted into the lungs along with the air in breathing: and if the latter, whether it is identical with coal, as Dr Christison has inferred from his experiments on the black pulmonary matter, in a case of which the late Dr Gregory gave an account in the Edinburgh Medical and Surgical Journal."

Of the greater part of this lung the structure was obliterated, with the exception of some of the larger vessels. Although not softer than usual, nor disintegrated in its membranous structure, the surface exposed by cutting into the mass had exactly the appearance of fresh peat.

Thin slices of the lung pressed in a mortar with successive quantities of water continued to make them as black as ink for a long time, without any apparent abatement of colouring power. Indeed the proportion of black matter washed out in this way is not great considering its appearance. The coloured water does not pass clear through a paper filter. Before the lung was afterwards examined, it had been introduced into a solution of chloride of lime, which, however, went to dryness; and the animal matter in the course of some months disappeared by putrefaction. What remained was a hard stony mass, white on the surface from the lime, and of much less bulk than the original lung.

This mass was digested in strong nitric acid at a temperature not exceeding 100° F., and afforded a great quantity of a dense black powder, which was afterwards well washed with hot water, and then dried at 300 or 400 F. without emitting any empyreumatic odour. Sulphuric ether digested upon this black powder became of a dark brown colour, nearly black, and dissolved a quantity of a dark-coloured substance, which, when allowed to dry, had the consistence and smell of an extract, but was certainly of an oily nature, though not soluble in caustic potash. By repeated digestions in ether the black powder was entirely freed from this oily matter.

This black powder, of which the lung afforded more than an ounce, proved on examination to be little else than charcoal. It certainly was not coal. When heated in the air it burned readily without flame, and left an abundant fawn-coloured ash, amounting to 15 per cent of its weight. Heated to redness in a green glass tube, it emitted no visible fumes, but a little water condensed, without any other liquid. In the tube there remained a mere film of a white sublimate, which was pretty fixed, and not amounting to one hundredth of a grain. A small quantity of a combustible gas likewise came off, which burnt with a faint blue flame like carbonic oxide. 5.61 grains of the powder so heated yielded 1.3 cubic inches of a gaseous mixture, which was found to be composed as follows: In 100 parts, carbonic oxide 15.; carburetted hydrogen 2; carbonic acid 69.; nitrogen 14; = 100. The black matter did not fuse by the heat, and remained unaltered in appearance.

The black powder, as derived from the lungs, is unquestionably charcoal, and the gaseous products from heating it result from a little water and nitric acid being retained persistently by the charcoal, notwithstanding the repeated washings, but which, reacting on the charcoal at a high temperature, coming off in a state of decomposition.

In a comparative experiment soft coal was reduced to an impalpable powder, and carefully levigated. The fine powder, which continued an hour in suspension in water, after being agitated with it, was collected, dried, and afterwards digested in nitric acid and in ether, exactly as in the case of the carbonaceous matter of the lungs. 6.82 grains of coal-dust, after this treatment, were heated in a glass tube. Water came off holding ammonia in solution, a small quantity of tarry sublimate appeared, and 5.3 cubic inches of a combustible gas were collected, which burned with a white flame, and resembled coal-gas. It was composed as follows: Carburetted hydrogen 33; carbonic oxide 6; carbonic acid 30; nitrogen 31 = 100. It contained likewise a trace of ammoniacal gas.

It is proved by this experiment that the results of the distillation of coal, after it has been treated with nitric acid and ether, are still characteristic and sufficient to distinguish it.

The carbonaceous matter of the lung cannot therefore be supposed to be coal altered by the different chemical processes to which it has been submitted in separating it from the animal matter of the lung. The carbonaceous matter from this lung appears rather to be lamp-black. The coal-miners of this country, who do not use the safety-lamp, work in an atmosphere loaded with lamp-black, which is constantly falling over the face from the ill-trimmed oil-lamp attached to the forehead. Charcoal from this source is also in the most minute possible division, and less likely to irritate the lungs than granular particles of coal-dust. The sputum of persons coming out from a gallery in which a number of colliers are engaged at work is quite black from the inhaled sooty matter.

Lamp-black was prepared from the combustion of oil, and submitted to the same treatment as the carbonaceous matter of the lungs. 6.29 grains of this charcoal, when heated in a glass tube, afforded no sublimate, but 1.2 cubic inches of gas; which consisted in 100 parts,—of carbonic oxide, 16; carburetted hydrogen, 2; carbonic acid, 58; nitrogen, 24=100. This result bears so close an analogy to the result of the distillation of the carbonaceous matter of the lungs, both as to amount and composition of the gaseous products, as to prove that the substances are nearly the same.

2d. From Dr G. Hamilton of Falkirk. The lungs of a moulder in Carron Iron-works, whose case is described in the present number of this Journal. This lung had exactly the appearance of the preceding; but on cutting into it, it was found to contain hard depositions of calcareous matter, no mass of which exceeded ten grains in weight.

The carbonaceous matter was separated from the animal matter composing the lung by nitric acid, as in preceding case. It had exactly the same appearance, and burned easily at a red heat without flame. When distilled, it afforded a small quantity of a yellow oily liquid and ammonia, besides gaseous products. This oily substance did not contain a volatile principle like naphtha, and had no resemblance to tar. Our carbonaceous matter appears, therefore, to have retained a trace of animal matter, after its treatment with nitric acid and ether. 15.05 grains of the carbonaceous matter gave 3.8 cubic inches of gaseous product, which was composed of carbonic oxide, 42; carburetted hydrogen, 2; carbon acid, 41; nitrogen, 15 = 100.

The carbonaceous matter must have been nearly pure charcoal, as in the preceding case, and the gaseous products are due to the same cause. The carbonaceous matter might in this case be composed of the finely pounded wood charcoal, to the dust of which the patient was very much exposed in the course of his avocation as a moulder. The charcoal from the lung when burnt left seven per cent. of its weight, of a light fawn-coloured ash.

The proportion of foreign matter in the lung was in this case determined. The lung had been kept in spirits for a few days before examination. To remove the liquid which it had imbibed, the lung was cut into thin slices, which were submitted to pressure between folds of cotton cloth, but not dried by exposure to air, or by the application of heat. The substance of the lung may be considered as still retaining the greater part of its natural humidity. 208.3 grains of the lung in this state, treated as before described, left a quantity of charcoal, which was found to weigh 52.7 grains, after being dried at a temperature of 300° F. The result, therefore, is, that the lung contained 25.3 per cent. of charcoal, one-fourth of its weight, mechanically diffused through it, and quite foreign to its constitution.

3d. From Dr Laurie, from whom I received, at a subsequent period, the following notes of the case. "John Brown, aged 48, collier, Campsie, a robust muscular man, in apparent perfectly good general health. There is no remark made in the journals as to his being affected with cough or disease of any kind. And in none of the reports taken at his bed side is he stated to be annoyed with the slightest cough.

"The injuries for which he was admitted into the hospital were compound fracture, laying open the left knee-joint, and fracture of the scapula, clavicle, and ribs of the same side, caused by a mass of coal falling upon him. The first of these was so severe as to demand immediate amputation, which was performed above the knee on the 26th of June.

"The amputated limb, I well recollect, was robust, muscular, and very firm, so as to cause some little difficulty in making the outer flap. My two assistants (Dr Pagan and Mr Stirling) remarked after the operation, that the case was *very* favourable, which they would not have done had there existed any symptom of impaired health, more especially of chest complaint.

"On the 27th he was doing well. On the 28th the same. 29th, complained of pain in his left side, referred to his broken rib, for which the ordinary apparatus was ordered, but I rather think not applied. At half-past six of the morning of the 30th, he was suddenly seized with a very acute pain in left side of chest, confined to a small spot in the situation of the fractured ribs, and accompanied by a severe rigor, for which he was bled, &c. &c., but sank rapidly, and died at ten o'clock.

"*Inspection.—Thorax.*—A few ounces of bloody serous fluid were found effused between pleura on each side of chest. Left lung slightly engorged, not hepatized. Slight and circumscribed fibrinous effusion adhering to *pleura pulmonalis.* Second, third, fourth, and fifth ribs fractured. *Pleura costalis* ruptured; lung not torn."

The lung appeared equally black as the preceding, and afforded the black colouring matter with equal facility, when cut down and pressed in water. It appeared, however, sound, and to have suffered no change of structure. The carbonaceous matter was separated as in preceding cases. 220 grains of the lung gave 22.46 grains of charcoal. This charcoal retained a little animal matter, like that from the last case, and afforded upon distillation a little ammonia and oily products, besides gaseous bodies. 4.77 grains gave 1.85 cubic inch gas, which was faintly combustible, and consisted in 100 parts of,—carbonic oxide, 11.1; carburetted hydrogen, 16.2; carbonic acid, 56.6; nitrogen, 12.3; ammoniacal gas, 3.8 = 100.

The black matter in this case when burnt left nineteen per cent. of an earthy ash.

I subjoin a note of the 16th August, containing an account of two cases similar to the above, which were observed in the Royal Infirmary, by Dr M. S. Buchanan, and which, with the preceding case, prove that this extraordinary condition of the lungs may exist unobserved, and is compatible with general good health.

" According to your request, I now transmit to you an outline of the cases of two colliers who died while under my care in the Glasgow Royal Infirmary, and whose lungs were the subject of chemical examination. The first was that of James M'Quail, aged 40, from Polmadie, about two miles from Glasgow, admitted June 15th. While at work this man sustained a dreadful fracture of the pelvis by an immense quantity of coals falling upon him. It is of little use to particularize the injury. Suffice it to add, that extensive mortification immediately took place in consequence, and death followed on the 19th of June. He had previously been in the most perfect health, and during the five days he remained under my care, he had not the slightest pectoral affection.

" *Inspection.*—On both sides of the lungs was everywhere remarked the carbonaceous deposit denominated by Dr Carswell spurious melanosis.

" 2*d*. John Lyall, aged 29, engineer, Garnkirk, June 30, 1834, while superintending his work, fell from a height of about fifteen feet, alighting on his back, by which the spine about last dorsal vertebra was fractured, and in consequence paralysis of inferior extremities took place, accompanied with all the worst symptoms usually attendant on this irrecoverable injury. He died on the 7th July.

" The results of inspection of this case in regard to the thorax were very similar to those of the former; but what was remarkable in this case was, that, on inspection of the abdomen, some stratiform melanosis in the peritoneum was observed. This last patient was, previous to injury, in perfect health, and during his stay in hospital had no pectoral symptom."

From the whole results, I am disposed to draw the following conclusions.

1. The black matter found in the lungs is not a secretion, but comes from without. The *pigmentum nigrum* of the ox I find to lose its colour entirely, and to leave only a quantity of white flocks, when rubbed in a mortar with chlorine water. *Sepia*, which is a preparation of the dark-coloured liquor of the cuttle fish, was also bleached by chlorine. But the black matter of the lungs was not destroyed or bleached in the slightest degree by chlorine. It even survived, unimpaired, the destruction of the animal matter of the lung by putrefaction in air.

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2. This foreign matter probably varies in composition in different lungs, but in the cases actually examined seems to be little else than lamp-black or soot.

3. It is evident that the accumulation of charcoal in the lungs, which Dr Pearson remarks to occur more or less in every subject, may proceed in peculiar circumstances to a great extent, without affecting immediately the general health of the patient. In Dr Laurie's and Dr Buchanan's cases, all the patients were robust and healthy, had no cough, and no expectoration of black matter.

Observations on Spurious Melanosis, in a Letter of the 19*th August* 1834, *from Dr William Craig to Mr T. Graham.*

"As I understand that you have been for some time back engaged in a chemical analysis of the black matter occasionally found in the lungs of colliers, moulders, and others, it gives me great pleasure to comply with your request, in stating briefly the result of a few observations made with a view to determine the exact situation of the black deposit in such cases; and thus, if possible, throw some light on the question, as to whether this matter be the result of a morbid secretion, or inhaled into the lungs during respiration.

"According to our best authorities on pathological anatomy, we are led to suppose that black matter is found in the lungs, in three states, 1*st*, as the healthy black matter of the lungs, *(la matiere noire pulmonaire* of Laennec;*)* 2*d*, as a morbid secretion (true melanosis;) and 3*d*, as a foreign substance (spurious melanosis.) The first of these is considered a healthy, and the two last, morbid states, and each gives rise to a variety of appearances, according to the quantity of black matter deposited, and the nature of the texture in which it occurs.

"When I began to turn my attention more particularly to this subject, I was impressed with the idea, that the above division was correct, and founded on observation; but after making a number of inspections, chiefly of old people, who had been for a considerable number of years inmates of the Poors' Hospital of this city, I felt inclined to change my opinion, and regard the division as merely theoretical. I found that a black discoloration of the lungs was by no means a rare occurrence among these old people, and that it was impossible, in many instances, to decide whether the black colour was owing to an increase of what is called the healthy black matter, or to a morbid secretion, or to a foreign substance being imbedded with the atmospheric air. The test given by Laennec regarding the stain produced by the matter of melanosis being more easily washed off the hands than that produced by the black matter found in the bronchial glands, does not hold good, for I have often found the stain caused by the black matter of the bronchial glands as easily washed off as that from melanotic matter. When the bronchial glands, as I have frequently seen them, are converted into cysts containing black matter, then the stain produced is as easily washed off as that from melanosis. The cause of the one substance being more adhesive than the other is its being mixed with a quantity of fatty matter in the gland. After examining a considerable number of lungs, and finding that the division of the black matter into three kinds was not founded on observation, and that the descriptions of them, as given by the best authorities, were insufficient to enable us to distinguish them from one another, I began to think that, in every instance in which black matter is found in the lungs, it ought to be considered morbid. In order that a lung be perfectly healthy, it must be pervious to air throughout every part of it; and if black matter accumulates in any spot, so as to obstruct even one air-cell, this must be looked upon as morbid. In the lungs of almost all adults there is more or less of this black deposit, particularly on the outer surface of the organs, and in the interlobular spaces. So long as this is small in quantity, it gives rise to little or no uneasiness, and therefore has been considered as healthy; but let it accumulate so as to obstruct the air-cells, and then we find the respiratory functions sensibly affected by it.

" If we examine the lungs at different stages of life, we find as a general rule, that the quantity of black matter increases with age. In young children we find no traces of it, the lungs being of a reddish colour. At the age of 10 years the black matter makes its appearance on the outer surface of the lungs, and in the interlobular spaces. At the ages of 30 or 40 the lung presents a grayish or mottled appearance, and the bronchial glands contain more or less black matter. Between the ages of 70 and 100 the lungs are generally infiltrated with fluid black matter, which can be expressed from their cut surfaces, and stains the hands black. Thus it appears that this black deposit in the lungs, which is by some considered a healthy appearance, generally increases with age, and may at last come to be deposited in such quantity as to obstruct the air-cells, and materially impede the functions of respiration. So far as my observation goes, this is the species of black deposit which is by far the most frequently met with in the lungs. When it exists in small quantity it has been called the ' black pulmonary matter,' and when in large quantity ' melanosis.'

" There are many circumstances which favour the accumulation of this black matter in the lungs; for instance, long-continued living in a smoky atmosphere like that of this city,—the inhalation of coal-dust, as in the case of colliers,—or of charcoal powder, as in the case of iron-founders. There can be no doubt that we inhale foreign substances along with the atmospheric air. We find the mucus which has remained in the nostrils for some time to be of a dark colour; and, if we examine it with a microscope, we find that this is owing to the presence of small particles of dust, or other foreign substances, which the air may have accidentally contained. The mucus first coughed up from the lungs in the mornings is of a dark colour from the same cause.

The facts now mentioned prove, 1*st*, That foreign substances suspended in minute particles in the atmosphere may be inhaled into the lungs; and 2*d*, That the mucous membrane of the air-passages, by its continually secreting a viscid fluid, has the power of throwing off these particles. Now, if, in consequence of disease, the membrane looses this secretory power, then the particles adhere to it, and are retained. This appears to be the reason why some persons are more liable to the deposition of black matter in their lungs than others. I believe, that in all the extreme cases which have occurred in colliers and moulders, that there must have existed some previous disease of the lung which prevented the foreign substances from being thrown off. This is a most interesting subject, and well worthy of investigation. May not a tuberculated or excavated state of the lung favour the retention of the black matter?

"According to the view which we have taken of the subject, there are only two ways by which black matter may be deposited in the lungs. 1*st*, by a morbid secretion; and, 2*d*, by a foreign substance inhaled with the atmosphere. The former is a rare disease, while the latter is very common. I am inclined to think that the true melanosis generally occurs in the form of rounded tumours, which, when cut into, present a uniform black colour, without any trace of air-cells; while in the spurious melanosis the deposition is general, and black matter flows freely out when the cut surfaces are pressed; at first the lung is crepitous, and swims in water; but as the black matter increases, it becomes solid, and, as is the case in colliers who die of this disease, resembles a piece of wet peat in point of consistence. It is only in the cases of colliers, moulders, or others who inhale large quantities of black matter, that the lungs are rendered perfectly solid. In the great majority of cases the lungs are pervious to air, although they contain a considerable quantity of black matter.

"The best manner of ascertaining the exact situation of the black matter in such cases is, by inflating the lung slightly, drying it thoroughly, and then cutting it into slices in various directions. When a lung is prepared in this manner, the air-cells can be distinctly seen with the naked eye, and, by means of a small magnifier, the exact situation of the black matter may be easily ascertained. I have prepared lungs of different ages in this manner, and found that the quantity of black matter increases with the age of the subject. In the young child the walls of the air-cells are reddish or transparent, while in the old subject they are coated with black matter. I have prepared in this manner a piece of the lung of a collier, which was rendered perfectly solid by the infiltration of black matter, and on cutting it into slices, it presents a uniformly black surface, without any traces whatever of air-cell or bronchial tube.

" I have in my possession a specimen of an entire dried emphysematous lung, which shows very distinctly, in consequence of the dilated state of its air-cells, the situation of the black matter. As I look upon this preparation as very valuable on this account, I will attempt to give you a description of it. Its pleural surface presents a grayish or mottled appearance, in consequence of a mixture of the black matter with the dilated air-cells. The interlobular lines contain a considerable quantity of black matter. Dilated air-cells, varying from the size of a pea to that of a walnut, are seen on its surface. On making a vertical section of it, the cut surfaces present the usual appearance of an emphysematous lung. The air-cells are greatly dilated throughout its whole substance. Instead of being of their natural size, which is little larger than a pin's point, they are generally of the size of a pea. Some are as large as to admit the point of the little finger. In some parts the cells, besides being simply dilated, are ruptured into one another, and present cavities varying from the size of a hazel-nut to that of a walnut. In those cells which are simply dilated, the cavities are uniform, rounded and smooth on their inner surfaces; but in those in which rupture has taken place, the cavities are irregular in shape, and present delicate ragged portions stretching across them in various directions. In some parts these portions have an arborescent appearance, being in all probability the remains of arteries.

Let us now see in what manner the black matter is disposed in these dilated and ruptured air-cells. The cut surface of the lung presents an irregularly grayish or mottled appearance, in consequence of the black matter being more abundant in some parts than in others. In those parts where the air-cells are most dilated, the black matter is most abundant; and as all the cells are more or less dilated, the cut surface of the lung is darker than usual. When we examine one of these dilated air-cells minutely, we find that its inner surface is coated with a quantity of matter, which gives it a jet-black colour. This matter can be easily detached from the walls of the air-cells with the point of a pair of scissors, and when wetted it stains the finger black. When the walls of these air-cells are examined with a microscope, the black matter is seen to be deposited in the form of minute black grains.

"This preparation appears to me to throw great light on the situation of the black deposit, in consequence of the increased size of its air-cells. The lung was not inflated previous to its being dried. It was hung up in the state in which it was taken from the subject, who was a poor woman above ninety years of age, an inmate of the Poors Hospital of this city."

ART. VII.—*Observations on the Use of Arsenic in Cutaneous Diseases.* By JOHN THWAITES, M. D.

IT is not long since the prejudice which existed against the use of arsenic as a remedy in any disease, in a very great degree, prevented its introduction to general employment. For many years this prejudice was supported by the unhappy results which followed its exhibition in the hands of injudicious and unskilful practitioners, and it chiefly remained with empirics to use it as an ingredient in the various nostrums which were in extensive application throughout this country.

In the present paper I propose to consider its general properties and its remedial effects in the treatment of cutaneous diseases; and in doing so, it is necessary to remember that the effects produced by it as a medicine and as a poison are essentially different.

Its action as a poison may be concisely described as follows. We will find a diminished power in the heart's action: such intense inflammation of the stomach as to cause death some times (as related by Dr Anderson,) before time was allowed for any disorganization by which its action could be recognized to take place. When death does not so speedily ensue, we have vomiting of black or brown matter, violent griping and purging, fainting, excessive thirst, swellings of the whole body, delirium, convulsions, and death.

In the medicinal form its effects are totally different. We have, as the first proof of its affecting the system, increased fulness and strength of the pulse. This effect continues gradually increasing, until, to the force and frequency of the heart's action, we have added hardness as well as fulness of the pulse, so as in some instances to induce a general plethora, and finally an anasarcous state of the system, up to which period it may be safely continued. Together with this specific effect on the pulse, we have, in the earlier stages of its exhibition, swelling and itching of the *palpebræ*, redness and irritation of the *fauces*, slight cough, and a gradual coating of thick creamy fur on the tongue. All these latter symptoms precede the anasarcous state, and need not excite uneasiness in the physician's mind, so long as the swelling does not appear. It is to its effects as a stimulant that its dangerous properties have been usually attributed, and it is to the same that its beneficial properties as a medicine are due. The difference, however, mainly lies in the mode of its exhibition, and in the caution and judgment employed. We must, accordingly, keep in mind the nature of the disease under treatment, as well as the remedy we are using. Otherwise our practice is empirical, and the grounds of our confidence in a cure quite uncertain.

It is well established as a general pathological fact, that, whatever be the cause from which cutaneous diseases arise, they are in themselves of an inflammatory nature, and require to be treated as such. We find, however, inflammation of different degrees of intensity existing in different forms of cutaneous disease. We find likewise that their inflammatory nature is specifically modified by various circumstances. In some the resolution of the inflammation is slower in its progress than in others. Occasionally it subsides in one form, and sometimes in another. At intervals, the same form of the disease is more obstinate in the inflammatory stage than at others, and consequently requires more cautious treatment; and not unfrequently we have two forms of disease co-existing.

That class of cutaneous diseases which terminates in suppuration, (I mean the pustular,) is that which presents the most intense degree of inflammatory action in its earlier stages, and the most speedy subsidence. Those of a scaly character are slow in their progress, but the longest to retain the inherent principles of the disease. The same remedy, therefore, used at similar periods in these different forms of malady must necessarily produce very different results; and it is chiefly to this want of sufficient care in the discrimination of symptoms and of times, that we are to attribute many of the unfavourable results which followed the exhibition of arsenic. To administer this medicine before the severe stage is subdued, (either by nature or by art,) is to hurry destruction on the patient, and not on the disease. To regulate the state of the constitution, and bring it to a proper standard, so as to enable it to admit the powers of the medicines, is to pursue the line of practice most agreeable to science and to common sense; not forgetting either the *constitutional* derangement which also exists, and the considerable risk to be incurred in trifling with such an enemy as that. What cause, therefore, is there for surprise at the evils which follow the injudicious use of arsenic: headachs, flushings, palpitations, weakness, and pains in the limbs,—dyspepsia, and not unfrequently even mania; in many cases continuing for years? All these have been known to succeed its incautious administration.

The chief inquiry now before us is, at what period of the disease, and under what circumstances, may this medicine be used; and when should it be withheld? The reply, as far as I am capable of giving it, shall be as concise as I can make it. In the forms of cutaneous disease in which the practitioner may feel disposed to employ it, the most favourable time for its exhibition is the latter stages, when the violence of the attack is subdued either by extensive depletion, or by the exhausting efforts of time. In recent affections, its use must be deprecated for the reasons before stated. In cases where there may exist thoracic or cerebral disease, it is highly dangerous, until these have been completely subdued. Its beneficial effects are most speedily perceptible in that class of skin disease which resolves itself most speedily, *i. e.* where the local inflammation most speedily terminates in the cutaneous deposition. I have before mentioned the class in which this occurs; and in females it will be found to predominate. In that class in which it is *slowest* in forming its characteristic appearance, however, the use of the medicine may be farthest pursued, for reasons agreeable to the former remarks; nor need there be the same cause for cessation in the use of it here as in the other forms. It may, however, be very needful to interrupt occasionally its employment, in order to prevent any unpleasant symptom from becoming aggravated, and this is the case most usually in the more inflammatory class.

I would here take occasion to observe, that I cannot agree with my friend Dr Houghton as to the remarks which he made on this subject in his description of the treatment of *Lepra* in the Cyclopædia of Practical Medicine, where he states, that "If the skin do not discover its action, (*i. e.* the action of the medicine,) when the characteristic signs appear, there is no necessity, indeed it would be improper, to continue its use." I have observed the effects of asenic on the constitution sometime before its salutary action on the disease was at all perceptible; and I am confident, that, had I learned the use of the medicine as soon as I began to observe its constitutional action, the recovery of the patient would never have taken place. Moreover, there is not always cause for despair, even when we are necessitated to suspend the employment of it; for, not unlike the action of mercury, its effects lie concealed in the constitution, and exhibit themselves where its use is suspended.

This, perhaps, may be explained. We are not always able to recognize the line of boundary between the action of the disease and that of the remedy we employ, or where the one ceases and the other commences. We may be led, therefore, to push a medicine farther than is necessary, and keep up a degree of over-action, which but impedes its specific influence, but which influence commences to operate as soon as the over-excitement is removed. The same holds true as to the dose of the medicine. When suddenly given in large doses, its effects pass the limits of its specific power, and cease to be useful,—nay, they are highly dangerous. Accordingly, caution in this respect should be observed. A commencing dose of two or three drops may delay the patient's recovery for a few days, but cannot be injurious, while a gradual increase of the remedy will bring with it more surely its gradual and beneficial results. A sudden and larger dose may so act on the constitution as to preclude the trial of the remedy again for ever.

It may be asked, how is it that arsenic is so useful? Setting aside its specific powers, which some assert that it possesses, it appears to me to act in a very simple as well as effectual way. It may be considered, that in all parts where inflammation existed, upon the resolution of that state, there is left behind a degree of consequent debility. This is always proportioned to the extent of disease. When, therefore, we have a large surface of inflammation, as in the majority of cutaneous diseases, we must calculate upon the corresponding reduction, not only in the powers of the constitution, but in the vital energy of *the parts attacked.* Upon the removal of the disease, such means, therefore, must be employed as will restore the strength of the system, and yet not overstimulate. We have this remedy fully within our reach here; as, by the command which we possess over its exhibition, we can regulate it at pleasure. There is no occasion for overloading the digestive organs with a quantity of medicine, and consequently aggravating the evil, as in the use of the decoction of sarsaparilla, infusion of bark in lime-water, and various other remedies, which by their quantity annihilate their own beneficial properties. The tone which the stomach receives by the application of this medicine is communicated to the external surface, while a stimulus is given to the heart's action, which gives it an *equalized* and healthy energy, tending considerably to promote the advancement of general health. May not this stimulus be likewise communicated to the absorbent system, and then produce a species of operation mainly contributing to the cure?

The above observations may be illustrated by the following cases.

1. A lady, aged 36 years, had been affected with a very severe form of *porrigo furfurans* for a period of several years before I saw her first; during which time it continued with scarcely more than an occasional remission of the symptoms.

Its history was as follows. Its first appearance presented itself after a severe attack of *erysipelas*, which followed exposure to intense heat of the sun, after having her ears bored by an unskilful person. The *erysipelas* extended over her head, face, and neck, and having lasted for some days disappeared. Shortly after a slight pustular eruption exhibited itself at the roots of the hair in the forehead, which gradually spread to the ears and side of the face. Here and there a few pustules appeared over the scalp. A considerable degree of indisposition accompanied the attack, and, as may naturally be supposed, not a little distress of mind. Many eminent practitioners, both surgeons and physicians, were consulted in regular succession; and an extensive application was made to the shop of an eminent apothecary to procure medicines of every gradation, size, shape, and name. No further benefit, however, resulted from the use of these various remedies, than an occasional partial suppression of the disease. As soon as some scales fell off other pustules appeared, and fresh crops continually poured forth, until wearied with remedies, with the distress of the malady and unhappiness of mind, she at length gave up all hopes of recovery and quietly determined to bear her misfortunes as patiently as she could.

Just at this period, 1829, circumstances occurred which placed her under my care; and, perceiving the melancholy state to which she was reduced, I resolved to try how far I could relieve her. It was with great reluctance that she consented to make the experiment. Having ascertained upon inquiry the extent of her *pharmaceutical experience*, I discovered that two remedies were left untried, namely iodine and arsenic. I got her consent to give them each a fair trial; and, being satisfied that there existed no constitutional objection to their employment, I commenced with the tincture of iodine, (the only preparation then in use) in doses of five drops three times a-day. I continued this medicine until it amounted to a dose of sixty drops daily; and to that extent she continued the use of it for three months, at the end of which time she was not better than when she begun.

This total failure disheartened both her and me; but I was determined to use the permission I had obtained for one trial more. After a few weeks, during which time I suspended all medicine, she commenced with the arsenical solution, in doses of *two* drops three times daily. At first she was apprehensive that the disease was rather increasing than diminishing; however, as no unpleasant constitutional symptom appeared, I resolved to push it as far as I could. After she had arrived at a dose of six or eight drops three times daily, she began to complain of general uneasy sensations, soreness of the eyes, fulness about the heart, as she termed it, swelling of the feet and occasional headachs.

I now began to diminish the dose as gradually as I had increased it. After a few days the skin assumed a much healthier appearance in the spots where the incrustations came off. No fresh pustules ensued. The general health returned; her spirits revived, and gradually the whole disease vanished, and has never since, for a period of nearly four years, returned. Her health has ever since continued perfectly good in every respect.

In this case it appears to me that the principles laid down above are verified. The arsenic was not commenced until, after a period of many years, the disease (as a constitutional one) had lost its inflammatory character, and merely preserved that tendency and disposition to local morbid production, which was the consequence of long-continued irritation of the parts. During the whole of the foregoing treatment, I did not permit the use of any local application.

2. A lady, aged 50 years, temperament sanguineous. About two years before I saw her, she suffered an attack of *erysipelas* in her head, in London, where she was attended by Sir Henry Halford and Dr Vance. She recovered, after a severe illness, from the *erysipelas;* but soon after there appeared symptoms of *porrigo furfurans* along the roots of the hair, and over the ears and side of the face. Upon her arriving in Dublin, she consulted an eminent and worthy practitioner here. He employed various remedies with various degrees of success, and ultimately ordered her to Harrowgate, where she experienced, in the summer of 1829, a second attack of *erysipelas.*

Upon her return to this country, the cutaneous eruption was as severe as ever. She went to the country for the purpose of re-establishing her general health, when she suffered an attack of bilious fever, which lasted for nearly three weeks. She had no sooner recovered from this than an extensive eruption of an erythematous and highly inflammatory character came out on every part of her body, but most severely on her head and neck. Whether exhibition of mercury was or was not the exciting cause of this I cannot tell.

About the month of September 1829, she came again to Dublin, and placed herself under my care. When first I saw her, so desperate was her case, that I had scarcely even a hope of being useful. Her whole face, neck, arms, and body, were covered with a florid dry eruption, here and there desquamating to an extent that would frequently shower down from her forehead when she stooped her head for any purpose. Her eyes were languid and dull; great heaviness and fulness of her head;

anorexia; quick full pulse; and hot unperspirable skin. She seemed greatly depressed in her spirits, and shook her head in despondency when I spoke of my exertions for her relief. The pustular eruption before-mentioned was considerably aggravated, which added much to her distress. I ordered her to be bled to sixteen ounces, and to take a purgative mixture with tartar-emetic sufficient to produce some nausea, and to be continued at intervals. This afforded relief to the general oppression of the system, and enabled me to use other remedies. Conceiving that there might exist some degree of biliary derangement, I ordered nitro-muriatic acid, in doses of four drops three times daily, and aperient pills. Although her spirits and general health improved under this treatment, the eruption continued still very severe. During this time she took daily exercise in the open air.

I then commenced the use of sulphur baths, which, however, after a few days produced so stimulating an effect, that I was obliged to discontinue the use of them. I now ordered a repetition of the bleeding, which was accordingly pursued with great relief to her; and, in the course of a fortnight, it was again repeated. The inflammatory state of the disease seemed to be now subdued. Her pulse had become quiet and soft; her head free from oppression or pain; her eyes clear, and a slight disposition to moisture on her skin.

I now commenced with the exhibition of the arsenic in doses of three drops twice a day, to be gradually increased one drop each day. For a fortnight no appearance of amendment appeared, nor do the notes of the case state any unpleasant symptoms. In about three weeks, however, the skin began to lose its florid colour; the desquamation became less; the porriginous eruption disappeared, and in another fortnight her health became so perfectly established in every respect, that, like the fact so beautifully related by the Prophet of Israel, her "flesh came again unto her, like to the flesh of a little child, and she was clean."

The observations upon this case need be very few. Every precaution was employed to preserve this patient from the evil effects of the medicine. Extensive depletion, powerful aperients, and mild alteratives, paved the way for its successful exhibition. The suppression of so extensive an eruption, however, in a person advanced in life, could not be allowed to remain unwatched; and, accordingly, upon perceiving on a subsequent occasion some determination to the head, I requested the assistance of the attending surgeon, who established an issue in her arm, since which time she has experienced a state of perfect health for a period of three years and a half.

3. The next case was that of a girl, aged 16, affected with *lepra* for six months, situated on the thighs and arms. She commenced with a dose of four drops twice a-day, to be gradually increased. She continued the medicine without any apparent benefit for three weeks. Being obliged to go to the country, she neglected the medicine for some time, and, upon her return to town, resumed it. In the course of a fortnight more the scales disappeared, and never since returned. No unpleasant effects whatever were observable here.

4. The following case is highly illustrative of the observations made before on the length of time arsenic may be exhibited in the scaly form of cutaneous disease. It is related by Mr Anderson, in whose writings on the subject I discovered it after I had concluded this paper, but which I could not withhold from inserting, in consequence of its remarkable corroboration of the statements laid down.

The case is one of *lepra vulgaris*. "When first I saw him the eruption covered nearly the whole body, and was of considerable thickness, being complicated with an ulcer of the fauces apparently syphilitic, and iritis of one eye. The case was treated with mercury and sarsaparilla. The iritis and sore throat were cured, but the eruption did not yield. He was then put on the use of the arsenical solution, in doses of five drops three times daily. It was pushed at length to ten drops before the affection yielded. The use of the medicine was then given up. In three weeks the eruption appeared again, was again cured, and a second time returned. This routine was gone through many times, until my poor patient was reduced to the necessity of choosing the least of two evils, namely, the taking a daily dose of medicine. He has now been taking the solution constantly for the *last year;* he perceives no bad effects from its use; he goes about his usual avocations; his pulse keeps steadily above 100, full, and strong; his eyes are suffused and watery; the *palpebræ* slightly inflamed; the appetite good; and his general aspect is that of a person in high health. He informs me that he suffers no inconvenience from the use of the medicine, and declares his willingness to continue it as long as necessary. I may here state, that, though thirty drops each day were required to cure the disease, fifteen appear quite sufficient to keep it in check."

These cases will, I trust, serve to illustrate the general observations already made; and, as my wish in relating them was merely to afford practical examples of these principles, I hope that they will prove sufficient for my purpose without detail of further particulars.

34, *Kildare Street, Dublin.*

ART. VIII.—*An Account of Dysentery as it occurred in the Edinburgh Charity Workhouse during the years* 1832 *and* 1833, *where large doses of Calomel were found highly useful.* By JOHN SMITH, M. D., Fellow of the Royal College of Physicians, and Physician to the Charity Workhouse and City Lunatic Asylum.

BEFORE proceeding to the history of the disease. it may not be improper to state shortly a few particulars relating to the situation of the house, the character of the inmates, and the nature of their diet.

The house stands in one of the healthiest parts of the town, being quite detached from every other building, and in an open and elevated situation. It is of an oblong form, and fronts the south-east. It is destined for the reception of paupers, the most of whom are old and infirm, and contains about 400 residents. The health of the inmates, generally speaking, is good; and many of them who, on their admission, appear worn out and exhausted, soon regain a wonderful degree of flesh and strength. This, I have no doubt, is principally owing to the healthiness of the situation, to the regularity with which their food is distributed, and to the system of good management maintained in the house.

The wards are large and well-ventilated, and the inmates sleep two and two. The diet is chiefly vegetable and farinaceous, with a small proportion of animal matter. The diseases to which they are liable are generally of a chronic nature; and during the summer and autumn, affections of the bowels, as diarrhœa and dysentery, and English cholera, generally prevail in a greater or less degree,—in all probability owing to the constant use of vegetable food. These diseases may therefore be said to be endemic in the Institution.

I should mention that it was during the winter and spring of 1832 that Asiatic cholera was at its height here, and that although the disease broke out in the Lunatic Asylum situate within the bounds, and only at the distance of about 150 yards, no case occurred in the work-house; on the contrary, the health of the inmates was more than usually good. This exemption may be to a certain extent ascribed to the judicious care of the managers, by whom a strict quarantine was imposed, and every means considered preventive were put in force.

Such, then, were the circumstances under which dysentery made its appearance on the 24th July 1832, and when the weather was not marked by those evident signs which are considered predisposing. The first person seized was a young man of broken down constitution. The nurse who attended him was next attacked, and then the disease appeared almost simultaneously in different parts of the house. The attack generally commenced with vomiting and purging, pain of the abdomen, and a considerable degree of fever, the pulse in many cases being frequent and sharp, and the skin dry and hot. In others, however, a degree of collapse followed the vomiting and purging, the pulse was small and feeble, the surface cold or covered with clammy perspiration, and the features sunk. In some cases diarrhœa went on for several days, when *tormina* and *tenesmus* succeeded. The matter vomited was generally the ingesta or mucus. It was seldom or never bilious. The pain of abdomen varied very much both in degree and in situation, although it was very generally referred to the umbilical and hypogastric regions.

The epigastric region was often the seat of it, and then there was great irritability of stomach, and vomiting, and a constant burning sensation. In some the abdominal tenderness was very trifling; but this by no means indicated a mild form of the disease, for the patients to whom this happened, feeling no pain, often allowed the disease to go on till it was in its worst stage. The state of the tongue was various; at the commencement, when fever was present, it was dry and furred. It was often coated in the centre, but moist, and red at the edges. This might be considered the most frequent condition of the tongue. In the most aggravated cases it was dry, parched, and red; and in some, when the other symptoms denoted a severe form of the disease, it was almost natural. Thirst was generally an urgent symptom, but more particularly in the advanced stage of the disease, when there was great gastric pain and irritation. In such cases there was a constant desire for cold water to relieve the burning sensation in the stomach.

The sound of the voice was in many cases peculiar; it was low and whispering, particularly when there were symptoms of collapse. The respiration was not affected in such a way as to be remarked as a characteristic symptom. Tenesmus was present in every case, and in the advanced stages the distress attending it was truly harassing. The desire to go to stool was constant, from the feeling that there was always something in the rectum to be evacuated, and the patient, if allowed, would never have ceased straining.

The appearance of the dejections was very various, but always without bile. At the commencement they consisted frequently of blood and mucus, with an intermixture of *scybala* or thin *feces*. Sometimes they consisted of *feces* altogether of an ochrey or dirty-yellow colour, and totally without bile. As the disease advanced, they sometimes resembled water in which raw meat had been washed, with shreds floating in it, or were more consistent, and looked like minced meat. At other times, they contained blood, pus, mucus, and slime mixed. At times and in the more advanced stages, large quantities of pus of a white, and again of a deep mahogany, colour were passed. These discharges always marked a severe form of the disease; but the inspection of those who died under such circumstances discovered no extensive ulceration of the intestines, but the enlargement of the mucous glands, and a vitiated secretion exuding from them.

The minced-meat-looking stool was often among the first symptoms of the disease, and this always augured the worst form of it. The *tormina* and *tenesmus* in such cases were most harassing.

The scybalous form of the *feces* was very characteristic, as *scybalæ* were observed in every case in some period of the disease. Sometimes they appeared at the commencement, sometimes not till the disease had gone on for several days. They would disappear, and towards the termination they would be again observed, and their reappearance always augured a favourable termination. During convalescence, the tendency of the feces to assume this form continued, and it required great attention to keep it under. The quantity of matters discharged from the bowels in the different cases varied very much; sometimes it was very considerable at every motion, at other times it was very trifling. When the quantity was small, the *tenesmus* was almost constant.

The urine was generally scanty; but it was rarely the patient complained of any difficulty in passing it, or led me to suppose that he was suffering distress from any interruption of the function of the bladder. Flatulence was scarcely an attendant upon the disease, and tympanitis was rarely observed during life or after death. Hiccup occurred in a few cases in the advanced stage of the disease; but it was not here, as it very generally is, a precursor of a fatal termination. Delirium rarely supervened but in the worst cases; and in the advanced stages was almost a sure indication that the sufferings of the patient were near a close.

Inspection.—The following description of the morbid appearances is drawn from the examination of about thirty cases. The chief seat of the disease seemed to be the large intestines, as these in every case were invariably found to have undergone a greater or less degree of alteration of structure. In the worst cases, the colon, rectum, and cœcum, were much thickened and congested in their whole extent, and the mucous coat was elevated into transverse ridges, which were rough and granular, perhaps produced by the effect of a deposition of coagulable lymph. Between these ridges numerous small ulcers were frequently observed. They were often very small, and rarely presented a surface larger than that of a split pea. The submucous tissue was always highly injected; portions of it were frequently found much ecchymosed, and large vessels were sometimes observed in it. The whole internal surface of the intestines was generally covered with a dark-red puriform secretion, similar to what had been voided before death. Sometimes, though rarely, the size of the ulcers would equal that of a shilling, and their edges were generally high and unequal. Ulcers of this extent were more frequently found in the *cæcum* and surrounding the *valvula coli.* In one case only did I observe the coats ulcerated through, and this was in the transverse arch of the colon, and to so small an extent that no extravasation had taken place. When diseased structure existed in the large intestines to this degree, the small were generally found in their whole course, though more particularly towards the lower end of the *ileum*, very highly congested, and covered with a dark-coloured secretion. The pyloric extremity of the *duodenum* was generally found injected, and the glands there enlarged. In some cases the mucous coat of the stomach, more especially near the *pylorus*, was found injected, with ecchymosed portions, and containing a quantity of dark-coloured secretion. Small quantities of scybalous *feces* were sometimes found in the *cæcum*, or in the course of the colon.

In less severe cases similar appearances were observed, but not to the same extent. In some cases of this class, there was only the highly congested state of all the coats, without thickening or ulceration, or the granular deposit. In others there was congestion with slight thickening, and a degree of the granular deposit, but without ulceration, or, if it did exist, it was only around the *valvula coli.* In the milder cases the secretion covering the mucous surface was generally of a redder colour than that found in the more aggravated.

In many cases the small intestines presented scarcely any diseased appearance, the morbid action not having extended beyond the *cæcum.* In almost every case, however, the submucous tissue of the pyloric extremity of the *duodenum* was found injected and the glands there enlarged. The appearance of the external surface of the intestines was various; sometimes it presented one uniform livid appearance, when the abdominal *peritoneum* was in the same state; at other times livid patches were to be seen only here and there. In some cases the external surface of the intestines was almost natural, when the internal would be found presenting the most aggravated form of the complaint. When there was much thickening of the coats with the granular elevation of the mucous surface, the calibre of the intestine was much contracted. It was stiff and leathery, and did not collapse. Distension from flatus either of the intestinal canal or of the abdominal parietes was very rare. On the contrary, the abdomen was generally found fallen in, and the small intestines were soft, doughy, and collapsed. The mucous surface of the small intestines in many cases, even when not injected, was easily abraded, and that of the stomach was often in the same state.

The liver in no case presented the appearance of recent morbid change, or such as seemed to have taken place in the course of the disease. In two or three cases it was congested. The gall-bladder was found invariably distended with bile, to all appearance healthy, so that this secretion did not seem to have been interrupted or vitiated. The bladder of urine did not present any appearance of inflammation or congestion. It was generally found distended, although in several it was empty and contracted.

Treatment.—The disease soon after its appearance having assumed a very virulent character, and the remedies I had been in the habit of employing failing to have any control over it, I was obliged to look out for some other mode of cure.

In the treatment of Asiatic cholera, I had witnessed the exhibition of large doses of calomel, such as we had not been accustomed to in this country; and although not with the success that could have been wished, yet so as to remove the fear of any risk from the administration of such doses. It occurred to me at the same time, that, between the symptoms of cholera and the endemic I had to contend with, there was considerable resemblance. Both diseases came on in the same way, by vomiting and purging. What was ejected, although not the same in both, yet agreed in this particular circumstance, that it was without bile. There was a burning sensation at the pit of the stomach, along with a desire for cold water in both. The *post mortem* appearances exhibited this similarity, that the gall-bladder in both diseases was found invariably distended with bile.

Under these circumstances, I was led to make a trial of calomel in scruple doses, the immediate results of which experiment went far beyond my most sanguine expectations; and I have the satisfaction to state, that in no case where the system was brought under the influence of calomel, and ptyalism induced, did a fatal termination to the disease ensue.

The first case in which I exhibited the large doses of calomel was one where the vomiting was incessant, and the sensation of burning at the pit of the stomach extreme. The first dose was followed by relief to these symptoms. Encouraged by this happy result, I made trial of it in every stage of the disease, even when the symptoms were most unfavourable, and when, from the advanced age and enfeebled constitutions of the patients, success was scarcely to be expected. Before giving the calomel, if the symptoms were such as to indicate blood-letting, this remedy was had recourse to; at the same time a laxative dose was given. The greater proportion of cases not requiring bleeding, the calomel was in general at once had recourse to, in the dose of a scruple, sometimes with the addition of a grain of opium, to be repeated every four or six hours, according to the urgency of the symptoms, and continued till ptyalism was produced. This effect, if it was to take place, was commonly produced in twenty-four or thirty hours, when the calomel was intermitted, and a dose of castor oil was ordered.

The immediate effect of the calomel seemed to be to produce a flow of bile into the intestines, and the stools, which before consisted of blood, mucus, pus, and shreds, now presented the appearance of bile, and were spinach-looking.

As soon as the bile was observed in the stools, an immediate abatement of the symptoms took place,—the vomiting and tenesmus were relieved,—the pain of abdomen and heat at the pit of the stomach were diminished,—and the patient was considered out of danger.

After the mouth was affected, the after-treatment consisted merely in regulating the diet, and in giving a mild aperient, such as castor oil, every other day, to carry off the vitiated secretions, and in relieving occasional pain and irritation by the exhibition of opiates. In some cases, particularly where there was a strong tendency to the formation of scybalæ, the castor oil had to be given for several weeks, before the stools were of natural form.

In addition to these effects upon the bowels by the calomel, a state of reaction was produced, and the pulse became full and soft, the skin moist, and the surface warm. In several cases the reaction was such from the effect of the calomel that delirium ensued. Notwithstanding the large quantity of calomel given in many cases before ptyalism was induced, severe salivation did not occur in more than two or three instances, and this perhaps was to be attributed to an additional dose being given to make sure of the effect. But notwithstanding this favourable view of the subject, I should mention, that in several of the cases occurring in the course of last summer, the large doses of calomel were not found to be quite so efficacious;—as on several occasions, they seemed rather to increase the irritable state of the stomach. I have not been able to satisfy myself as to the reason of this, as the cases were very similar in all respects to those of the year before, and as in the cases that have occurred this season, the calomel has been followed by the same happy results. My confidence, however, in the large doses of calomel is now such, that in no case of dysentery or ex-bilious diarrhœa do I hesitate in giving it; and even in common cases of diarrhœa where bile is not to be seen, I am in the habit of prescribing ten grains of calomel, with a grain or half a grain of opium, to be followed by a dose of castor oil in five or six hours. This plan seldom fails to produce a flow of bile; and one or two doses are in general sufficient to check the diarrhœa.

Having said so much on the effects of calomel in large doses in arresting the progress of this disease, I shall now make a few observations on the other remedies commonly employed. And first with regard to blood-letting. From the disease occurring generally without acute symptoms, and the subjects of it being for the most part old and infirm, I had seldom occasion to make use of venesection. Some cases, however, were accompanied with such a degree of fever as to indicate the propriety of having recourse to the lancet,—but I found it necessary to do so with caution; for although the state of the pulse and skin showed a high degree of vascular action, the withdrawing of twelve or fourteen ounces of blood was generally followed by a great degree of depression. In no instance did the blood exhibit the buffy coat, but the coagulum was invariably very large. From the character of the disease, blisters to the abdomen promised to be a more useful remedy, and my experience goes to confirm this. The mode of blistering I gave the preference to was that by the nitrate of silver. It is much more expeditious than that by cantharides, is equally effectual, and causes no irritation of the urinary organs. Much good was derived from the repeated application of mustard cataplasms to the abdomen.

I found opium a very valuable remedy. It was generally given to the extent of six or seven grains in the course of the day, in doses of one or two grains; sometimes when the symptoms were very urgent, three or four grains were given at once. The only aperients I had recourse to were castor oil, and a mixture of equal parts of magnesia, rhubarb, and sulphur,—in the dose of a teaspoonful. I cannot speak too highly of the utility of castor-oil, in the form of the disease I have had to do with. Its action seemed almost specific in restoring the healthy function of the intestines. From the quantity of vitiated secretions in the alimentary canal, a tablespoonful was generally given every morning, in combination with twenty drops of laudanum. The laxative mixture I have mentioned I found to be mild and uniform in its action. I made use of every variety of astringents, but the medicine of this class which seemed to me to answer best was the acetate of lead. The mode in which I gave it was that of pill, generally combined with opium, in the proportion of four grains of the former to one of the latter. Such a dose was given four or five times a-day. I never saw any bad effects from the lead, although many patients took from a scruple to half a drachm daily, for a week or two at a time. The nitrate of silver in the dose of one or two grains made into a pill, with a grain of opium, and given three or four times a-day, was a useful remedy. In two cases this quantity produced irritation of stomach. Astringent and opiate enemata were found useful in relieving the tenesmus in the early stage of the disease, but in the advanced stages, the administering of them only caused pain and irritation, as the gut then seemed to have lost all contractile power. It was of the greatest importance throughout the disease to keep up the external heat, and with this view the patient had generally several bottles of warm water, or hot irons, or bricks to his feet, and about his body, and the abdomen was covered with flannel. The diet consisted of diluent drinks and light farinaceous food.

In comparing the present account of dysentery with the histories given of the disease by various authors, it will appear to differ in some essential points. In the appearance of scybala at different periods in the course of the disease, and the tendency of the feces to assume this form after the severity of the symptoms had been subdued;—the gall-bladder being found invariably distended with bile, to all appearance healthy;—the liver presenting no marks of having undergone any recent morbid change, and the inflamed state of the pyloric extremity of the *duodenum*. In the accounts given by Dr Johnson, and Sir George Ballingall, of the disease as it was observed by them in India, and by Dr Cheyne, as it appeared to him in Ireland, the scybalous form of the feces does not seem to have been at all constant, or to be considered by them as a characteristic feature of the disease. Dr Johnson and Mr Annesley consider the secretion of the bile to be diseased, whilst, so far as my observation goes, its passage into the intestines was only obstructed. The distended state of the gall-bladder does not seem to have existed in the cases which came under Dr Cheyne's observation.

In the treatment of the disease, I have followed Dr Johnson's plan, of giving calomel in scruple doses, till ptyalism is induced. Mr Annesley is also an advocate for large doses of calomel, but avoids producing salivation; whilst Sir George Ballingall in the species of dysentery which he terms hepatic flux, gives mercury so as to affect the mouth, without assigning any preference to calomel in large doses. Dr Cheyne found blood-letting and large opiates more useful in subduing the disease in the form it appeared to him.

Great difference of opinion exists as to dysentery being contagious. So far as I have observed, it appears to me to be so; for several of the nurses have been affected, and the second person seized in the establishment was the nurse who administered the injections. It was not uncommon for the disease to spread from one bed to another.

ART. IX.—*Remarks on Extra-Uterine Pregnancy, with Cases and Engravings.* By J. T. INGLEBY, Esq. Lecturer on Midwifery at the Birmingham School of Medicine.

IT is generally but not universally believed that conception takes place as a law of nature in the *ovarium* of a woman having reached maturity, and also that the embryo having acquired its different coverings, enters into and gradually passes through the Fallopian tube to the *uterus*, where it obtains a connection with the lining membrane, through the intervention of the *membrana decidua*, the placenta being formed at the point of union.

Meckel and others believe that conception usually takes place *in utero*. But may not conception be effected either in the uterus, tube, or ovary, less uniformly than we suppose, and thus explain trifling deviations in the term of pregnancy? In virgins the bursting of the external coverings of the *ovarium*, and the escape of a Graafian vesicle into the Fallopian tube, and subsequently into the uterine cavity, is not doubted. Why, then, may not impregnation take place without deviation in the laws of nature in any of these situations? Interruption to the transit of the conception to the *uterus*, which is inseparable from danger, occurs, I believe, more frequently than has been generally believed, and will be found to correspond with obscure and sudden instances of death.

Obscurity forms a prominent character of extra-uterine gestation. The evidences of pregnancy wherever the conception is lodged are merely presumptive during the early weeks. Respecting the abdominal tumefaction which at first is occasioned by gaseous intestinal distension, there is no peculiarity. The constitutional disturbance is said to be more severe in extra-uterine than in natural gestation, and this may depend either upon the tube inflaming, or not yielding kindly to the increase of the *ovum;* but the statement seems to require confirmation. About the fourth month of pregnancy, should it proceed so far, much of the obscurity which attends these cases will be removed, inasmuch at least as the uterus is concerned, for, assuming the organ to have prepared the decidua, and to have undergone some enlargement, this will presently be rendered stationary. It is alleged, indeed, that the uterus soon begins to diminish in bulk.

But so long as a child continues to grow in its immediate vicinity, together with the progressive developement of the blood-vessels of the part containing it, such a change can scarcely take place.

Until within a very recent period, three species only of extra uterine pregnancy were described by authors, comprising (in the vocabulary of Dr Granville), 1. *Gestatio tubica;* 2. *Gestatio ovarica;* and 3. *Gestatio abdominalis.* But to these another is now added, viz. 4. *Gestatio interstitialis.*—An account of this will be found in the first volume of the *Repertoire General d'Anatomie et de Physiologie,* edited by Breschet and others.

Of this species, Granville observes, "It is, therefore, impossible to deny the existence of another distinct species of pregnancy, *extra muros uteri,* in which the fœtus is lodged among the interstitial elements of that *viscus,* and has no communication whatever either with the cavity of it on the one side, or the cavity of the abdomen on the other; unless ulceration or laceration take place."* The course of extra-uterine pregnancy is by no means uniform. The sac may remain entire, even for half a century, and the child within it gradually be converted into adipocire, bone, or some other substance; (but this observation can scarcely apply to the tubal species of pregnancy.) Or, again, the sac may give way, and the child pass into the abdominal cavity, where it may obtain a fresh kind of shell, and remain an indefinite time, the sac shrinking and acquiring a degree of consolidation. According, however, to the more established course, the fœtus when liberated from the sac produces inflammation, adhesion, and subsequently ulceration, either of the viscera or the integuments, or both structures consecutively. Ultimately, it escapes, either wholly or in fragments, through one or more outlets, whether natural or artificial; and, provided the constitutional powers are effective, recovery will ultimately ensue.

Tubal pregnancy is admitted to occur far more frequently than other similar deviations from nature; and, although its course is more uniform than either the ovarian or ventral species, considerable variation has been observed. In a few rare cases, the enlargement has continued progressively increasing even up to the ninth month; the abdomen resembling natural pregnancy both in its figure and developement. Usually, the distended portion of the tube bursts before the third month; not, I think, by a gradual process of sloughing, according to Burns, but by a sudden and absolute laceration, the result of absorption. In the cases to which allusion will presently be made, the individuals were not conscious of any previous pain or uneasy sensation; a circumstance which is irreconcileable with a slow inflammatory and subsequently ulcerative process. But when the sac gives way at an advanced period of gestation, these processes will most probably take place, and be denoted by the usual symptoms. The external coverings of the *ovarium*, from their firmness, admit of a considerable distension with impunity; but the structures of the Fallopian tube, from their greater delicacy, offer a comparatively feeble resistance to the increasing developement of the ovum. We observe the same difference in dropsy, affecting these respective parts. In the Fallopian tube, the dropsical cyst remains small and circumscribed in bulk; but this is far otherwise as respects the dropsical *ovarium*, when the disease has been advancing for any length of time. The peritoneum, it is true, gives a covering to the *ovarium* and tube in common; but there is a strong cellular tunic, supposed to be an expansion of the ovarian ligament, from which the ovary derives a very material support, and a number of compartments which, *in hydrops ovarii*, ultimately become one immense cyst; whilst in the tube whose cavity is peculiarly small, we merely find a few muscular fibres and a delicate mucous lining connected by cellular tissue, in addition to the peritoneal investment.

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* Graphic Illustrations, p. 35.

Of the circumstances which favour the detention of the impregnated ovum within the ovarium little is known. Ventral pregnancy is said to arise either at the moment of the impregnated ovum quitting the ovarium, or, what is far more probable, on the bursting of a sac containing an embryo or fœtus. The *gestatio interstitialis* is to me altogether perplexing. To constitute this species of gestation, a remarkable laxity, or otherwise a rupture, of that portion of the uterine *parietes* which surrounds the orifice of the tube, must be presupposed,—a mere hypothesis, however.

But to return to the immediate object of my paper, *gestatio tubica*,—this singular deviation from nature cannot be explained otherwise than by supposing, either an obliteration of a portion of the tube, (occurring subsequently, it must be presumed, to the reception of the *ovum* within it,) or some imperfection of that muscular power which we conclude is exerted in its transmission to the *uterus.** The symptoms which denote laceration of the tube may be those of collapse only, or collapse in connection with severe pain, and the difficulty of determining the cause of the symptoms will be proportionate to the early stage of pregnancy. If the laceration arises soon after conception the utmost ambiguity will necessarily prevail. A detail of these symptoms must be superfluous, since, with the exception of the great pain which attends the more extensive lacerations, they will scarcely differ from the symptoms which denote an internal uterine hemorrhage after delivery, or an effusion of blood within the peritoneal sac from aneurismal lesion.

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* Extra-uterine pregnancy may be confounded with retroversion of the womb, and with extraneous growths. Natural pregnancy is liable to be considered as extra-uterine, when the *uterus*, from its thinness, together with great distension of the abdominal *parietes*, permits the members of the child to be felt with unusual facility.

The treatment of extra-uterine pregnancy must be regulated by the circumstances of each particular case. When the sac containing the fœtus remains entire, and the patient reaches the ninth month, an action resembling parturition may possibly ensue,[*] and the mass be forced more or less into the pelvis, possibly a portion of it may descend into the recto-vaginal septum. It must either be returned within the abdomen according to the rules applicable to retroverted states of the womb, or an incision carried through the vagina and the sac, with a view of liberating the fœtus, but the chance of the intestines descending, of hemorrhage, or the placenta remaining behind, as well as other evils, must be maturely considered.

Before such a measure be determined upon, the nature of the case must be free from ambiguity, or at least the strongest justification must exist. In M. Langier's case, reported by Bricheteau, of vaginal incision for supposed extra-uterine pregnancy, an ovarian cyst only was discovered.[†] Neglecting to liberate a fœtus in this situation may be equally disastrous, as is shown in the following case, the particulars of which, drawn up by my friend and colleague Mr Baynham, were obligingly communicated to me by himself.

"This case occurred in the Dispensary practice, in a woman aged 33, who was already the mother of three children. Two years had passed since her last confinement. In the latter part of the year 1819, she became the subject of *menorrhagia*, which, returning frequently and oftentimes with violence, compelled her to keep her bed. Upon one occasion she believed that abortion had happened. A recurrence of profuse hemorrhage took place, and she became my patient in the beginning of October, at which time she had no doubt of her pregnancy, having for more than a month distinctly felt the motions of the child.

"Oct. 26. Indications of premature labour occurred after some violence had been offered to her, and she did not experience any fœtal movements subsequently.

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[*] This action is not peculiar to extra-uterine pregnancy. I have known it arise in ovarian disease. So decidedly did this appear in one such instance in a woman who considered herself in the ninth month of pregnancy, that hours of pain elapsed before the deception was detected.

[†] See Lond. Med. and Surg. Journal for 31st May 1834, p. 560.

"Nov. 2. Regular and severe pain justified the expectation of speedy delivery, but the *os uteri* could not be discovered, although during the pains the head of the child was forcibly depressed. At the end of twenty-four hours, Mr Barr and Mr Blount Senior were called in consultation, but neither of them could make out any thing satisfactory. Considerable tenderness of the belly, and inclination to sickness rendered bleeding advisable; but although she was twice bled, no relief followed.

"Nov. 6. The labour-pains, which hitherto had been almost unremitting, now subsided. The head of the child occupied the cavity of the pelvis, and the anterior fontanelle was within reach. An attempt to pass my hand in the vagina failed by reason of the presence of the head, and, without this proceeding, there was no chance of detecting the *os uteri.*

"Under these circumstances, and with a patient gradually sinking into a state of hopelessness, I proposed making a free incision *per vaginam* through the intervening parts, and thus forming a direct outlet. My proposal was overruled, and the case terminated fatally on the 20th day. Vomiting, hiccup, and tenesmus harassed her incessantly in the last week. From the 4th to the 8th of November, she had a somewhat abundant secretion of milk.

"*Inspection seventeen hours after death.*—Extensive peritoneal adhesions; effusion of lymph and serum, with which some fecal matter was mixed up; a large tumour stretched across the abdomen, inclining chiefly to the left side. It rested partly upon the brim, and partly in the cavity of the *pelvis.* In attempting to separate its attachments, extensive laceration happened, and a fœtus of eight months growth became exposed. The *placenta*, which was small, firm, and almost without blood, was perfectly detached, and found loose in the cyst containing the child. The *uterus* was larger than the unimpregnated organ, and was situated on the right and outer side of the fœtal cyst. The left Fallopian tube was traced for some distance, and then became lost in the irregular structure of the sac. The left ovarium could not be found.

"The right Fallopian tube was pervious, and the ovary of the same side perfect. The internal surface of the *uterus* was highly vascular.

"A more favourable case for operation cannot be desired. The only drawback of success appears to be the great probability of hemorrhage after delivery, but this might be controlled with less difficulty than is apprehended."

"A case in some respects similar occurred to me" (observes Mr

Baynham) "a few years afterwards. Labour-pains lasted some days, and then ceased. The woman fell into bad health, but did not suffer from *acute* disease, so that a surgical operation was not *urged* upon her. After some months she left the town for Coleshill, and became the patient of Mr Davies. She there voided the bones of the fœtus *per anum*, and eventually recovered." *

On visiting Coleshill on the occasion of a Cæsarean operation, I examined these bones, and found them very natural.

When the fœtus has passed into the cavity of the abdomen, gastrotomy has been advised; but this measure cannot be contemplated before the seventh month, assuming the case to be clearly marked, and the child to be living. The operation is strongly countenanced by the French; but no positive rule can be enjoined. When the ulcerative process takes place, the case can only be treated on the recognized principles of surgery. Should the Fallopian tube be lacerated, the hemorrhage is generally, though not necessarily, fatal. Medical treatment must be almost nugatory. The amount of hemorrhage will depend partly on the period of gestation; but, after the tenth week, mainly on the state of the *placenta*, which will almost certainly be implicated in the laceration, since the greater part of the sac will be lined by it. Thus we find the effusion of blood far more extensive in laceration of the tube than in laceration of the *uterus*. In three cases, which had a fatal termination, the amount of effused blood within the abdomen was very great.

1. The first case occurred in Mr Baynham's practice, in a young woman about four weeks pregnant of her first child. She became suddenly faint at 8 A. M., and died at 6 P. M.

On examination, four pounds of coagulated blood, independently of serum, were contained in the abdomen. The *omentum* was attached by old adhesion to the right broad ligament of the *uterus*, near the situation of the ruptured opening. It is matter of conjecture whether inflammation about this spot had not extended to the tube, and produced obliteration. In this duplicature of the *peritoneum* was observed a tumour the size of a pigeon's egg, which comprised the Fallopian tube. The *peritoneum* had given way upon the upper surface of the tumour, and a small protrusion of some vascular substance was noticed. This appearance is distinctly seen in the interior of the tube. The *uterus* was about as large again as common. The *ovum* was nearer to the *uterus* than to the ovary; and the tube was impervious at its uterine extremity, and pervious only for a short distance in its fimbriated portion. The *uterus* was lined with

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* See Mr Davies' account of the case in Lancet for 19th February 1831, p. 702.

decidua, and the neck was quite filled with mucus, which plugged up the *os internum.*—(Plate I. Fig. 1.)

2. The second case occurred in the practice of Mr Bellamy, to whose liberality I am indebted for the preparation. The patient died in the course of a few hours from the seizure. Her symptoms were those of exhaustion only, without any apparent cause; for neither in this nor the first case was pregnancy even suspected.

On inspection, the tube was found to have given way, and a great quantity of blood was effused within its textures, and in the abdomen; but the embryo, which is very perfect, and seems to have reached the tenth or eleventh week, remained enveloped in its membranes in the centre of the tube. The *uterus* is considerably enlarged, and the *decidua* is beautifully formed, and lines every part of the interior of the *uterus* except the orifices of the tubes and the neck, at the commencement of which it terminates abruptly. The *cervix* and *os uteri* were plugged with gelatinous secretion.—(Plate I. Fig. 2.)

3. The third case was attended with several striking peculiarities, and is therefore given in detail. A woman in the fourth month of her seventh pregnancy was suddenly seized, whilst at breakfast, with a most violent pain in the left side of the abdomen, and extreme depression of the vital powers. She expressed her conviction that something had given way within her, and the slightest movement of the body was attended with great aggravation of suffering. The countenance was quite pale, the pulse was feeble, and there was a constant alternation of pain and syncope. It was supposed that the *uterus*, or some important vessel, had given way. Every means failed to afford relief, and death took place eighteen hours after the seizure, the movements of the child having, according to her statement, continued until shortly before death.

On examination, *post mortem*, a well-formed four months child, enveloped in the *amnios* and *chorion* in very close contact, was seen lying amongst the intestines attached to the *placenta*, two-thirds of which had passed through an extensive laceration in the left Fallopian tube, about an inch and half from its fimbriated extremity, where the tube had abruptly bulged out into a large pouch. The edges of the laceration were very ragged, and a mass of blood was extravasated between the peritoneal coat and the mucous lining. The *ovaria* appear quite natural, and the left *ovarium* contains a distinct *corpus luteum.* The *uterus* rather exceeds four inches in length, and appears very white. The abdomen contained at least three quarts of blood, including a large coagulum upwards of a pound in weight. The mucous plug is well formed, and the *decidua*, which is perfect, termi-

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MR INGLEBY'S CASES.

Fig. 1.

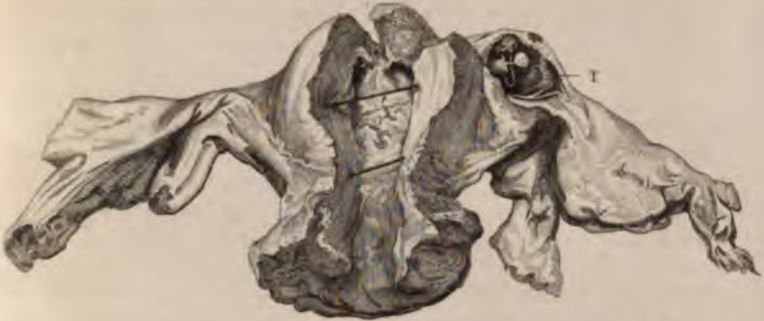

Fig. 2.

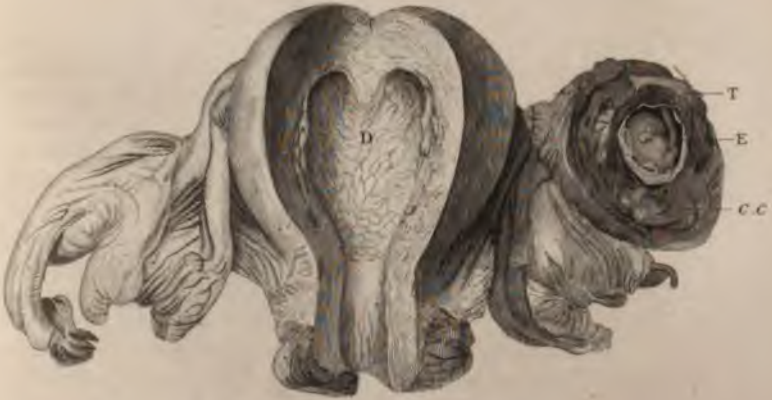

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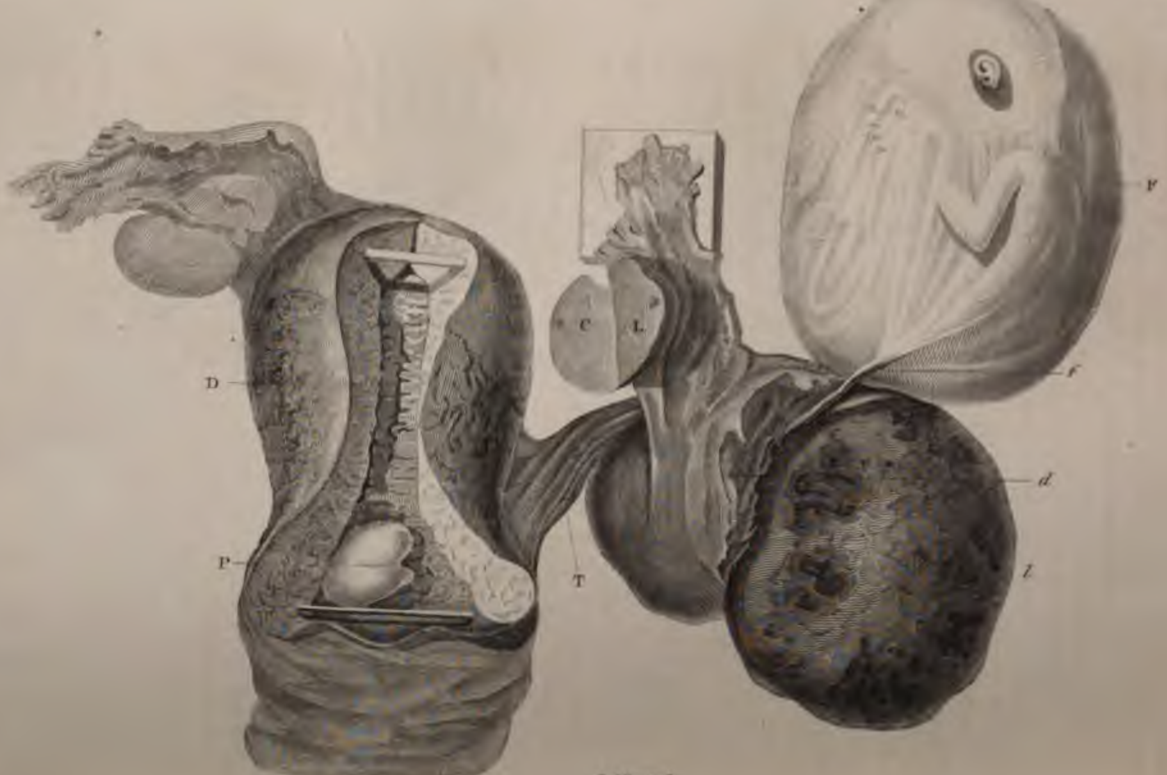
PLATE II.

p. 397 & 399, Vol. XI



G. Aikman, Sc.

nates abruptly at the *cervix uteri.* The circumference of the distended part of the tube, prior to the laceration occurring, could not, I think, have been less than ten or twelve inches. The internal surface of the sac is quite smooth, and invested by the membranes, and a large coagulum, having the membranes reflected over every portion of it, lay upon its lining; nothing like a covering of *decidua* is perceptible. The *placenta* is indistinct.—(Plate II.)

The patient was assiduously attended by my friend Mr Frederick Jukes, late resident surgeon of the Birmingham Hospital, by whom I was not only furnished with the notes of the case, but obligingly presented with the valuable preparation of which it is explanatory, and which is now deposited in the obstetric part of the Museum at the School of Medicine. It is a very perfect specimen; more perfect I think than the one represented in plate 36 of the work of Madame Boivin and M. Dugès.

Burns and Ryan describe the *placenta* as broader and thinner in these cases; and it is observed by the latter, that, in consequence of the fineness of the vessels, the child fails in obtaining sufficient nutriment, and dies in consequence. I doubt the validity of this inference. In two specimens of Fallopian pregnancy in my collection, from which the annexed engravings are made, the fœtal structures are perfectly developed; and in the case just detailed, it has been already observed that the movements of the child were apparent to the mother even after the tube had given way. The distended portion of the tube has acquired (as indeed might be supposed) a structure very similar to that of the uterus, and the funis appears to terminate on the edge of the lacerated surface of the tube, where the placenta must necessarily be very thin. A singular congenital malposition in this Fallopian tube consists in its attachment to the *cervix uteri*, and it appears that between the uterus and the sac it is quite impervious. (Plate II.) Whether this impervious state is coëval with the pregnancy, or whether it is of long standing, possibly a congenital malformation, is matter of speculation. If the latter, seminal contact is out of the question, and we raise the almost exploded doctrine of absorption; whilst again, the former conceptions must have proceeded from the right ovarium. The *corpora lutea* in the right ovary are indistinct.

Considering the perfect state of the *ovum* generally, may it not be inferred, that, so long as the tube remains entire, the fœtus is nourished equally as well as it is *in utero?* It will appear, from what has been already stated, that the symptoms which denote the rupture of the Fallopian tube are presumptive only. The embryo in its escape may either perish, and, if the patient survive, be absorbed together with the effused blood which accompanies it, or by possibility retain its vitality by obtaining a connection with some internal organ. Positive evidence of the rupture of the sac can only be obtained by *post mortem* research, and, should the patient happily recover, our opinion must rest upon a rational conjecture. I submit a striking case of this kind.

A lady, who considered herself in the sixth or seventh week of pregnancy, was seized very suddenly soon after retiring to bed with pain in the abdomen, succeeded immediately by paleness of the face and lips, a constant sense of fainting, a pulse 160, and scarcely perceptible, vomiting of the contents of the stomach, and the most alarming collapse of the vital powers. During the night and two following days there was little or no recurrence of pain; but the fainting threatened at times a fatal termination. The bowels were not disordered; but above the *pubes*, and to the right, a circumscribed fulness, or rather the feeling of a solid substance, which did not exist before the attack, was distinctly apparent.

As the symptoms could not be referred to any obvious cause, and as a similar train of symptoms were noticed in a case of Fallopian pregnancy which terminated the patient's life by internal hemorrhage, I suggested to the three physicians, viz. Dr Pearson, Dr John Johnstone, and Dr Male, who attended the case conjointly with myself, that a similar cause might exist here. The suggestion, which was not thought improbable, appeared to derive some support from the circumstance of a discharge of a serous kind tinged with blood, and not unlike the lochia about the second or third day, subsequently appearing *per vaginam*. On the fourth morning after the seizure, a membrane resembling the *decidua uteri* was expelled *per vaginam;* and the uterus on examination was found to be distinctly larger than it is in the unimpregnated state. Although the strictest caution was observed, neither fœtus nor fœtal membranes were at any time discovered. The patient gradually recovered, and the abdominal fulness progressively disappeared. The catamenia appeared at the end of the month, pregnancy recurred, and she was delivered at the full period of gestation.

It should be remarked, that this lady menstruated with singular regularity when not pregnant; one recurrent period had passed by, and she was within a week of the next expected period, when the alarming attack took place.

From the situation of the floating extremities of the Fallopian tubes above the brim of the pelvis and near the *ilia*, it will appear, that, when a laceration takes place, blood may be effused within the abdomen even at an early period of pregnancy, provided (as happened in this case) the body is recumbent at the time. The blood may or may not trickle down into the pelvis; but when the blood-vessels are small, its coagulation will rapidly take place. In one of the last reported cases of Fallopian pregnancy, occurring about the sixth or seventh week of gestation, it is stated, that an enormous black clot not only filled the pelvis, but extended into the iliac fossa; * and in a case already detailed here, it appears that four pounds of coagulated blood were contained in the abdomen.

Explanation of the Engravings.

Case I. Plate I. Fig. 1.—The *uterus* laid open.

Decidua well displayed from the *fundus* to the lower piece of green glass. From this to the *os uteri* the mucous plug is exceedingly well shown.

T. The left Fallopian tube laid open. A black spot above the head of the embryo shows the lacerated portion from which the hemorrhage proceeded. A vascular substance is seen surrounding the embryo. The *funis* passes under the delicate neck of the embryo. The rest explains itself.

Case II. Plate I. Fig. 2.—The *uterus* cut open. D. The *decidua* seen like a net-work. The *decidua* terminates abruptly at the *cervix*. The uterine orifice was quite shut up by a large mucous plug, now displayed in the preparation.

T. Left Fallopian tube laid open. E. The embryo very perfect. The membranes cut through and surrounding the embryo. *c. c.* Layers of *coagula* within the structure of the tube.

Case III. Plate II.—The *uterus* laid open. C. L. The *corpus luteum* very distinct. No recent *corpus luteum* was seen in the opposite *ovarium*. D. *Decidua* well formed. P. Mucous plug very perfect at the *cervix vaginæ*. T. The malformation of the tube entering the *cervix uteri*. *d.* The distended portion of the tube.

F. *Fœtus* and the membranes. A portion cut out to show the ear. *f.* The *funis* terminating on the edge of the laceration where the *placenta* necessarily is, but, from the *coagula* and hardening by spirit, it is very indistinctly seen.

l. l. The lacerated edges of the tube. A large coagulum inclosed by the membranes. The layers of the *coagulum* are easily removable.

Art. X.—*Cases and Observations illustrative of the Fatal Effects of Punctured Wounds and Injuries of the Orbit.* By John Scott, M. D. Fellow of the Royal College of Surgeons, Edinburgh.

The dangerous and often fatal effects of punctures, fractures, and injuries of the orbit have been long generally known to anatomical and surgical authors; and not only had some of the older surgeons occasion to remark the instances of sudden death from this cause, but Monro, Morgagni, and afterwards Portal, impress particularly the dangerous tendency of these wounds, in consequence of the chance of injuring the brain through the orbit, by reason of the extreme thinness and delicacy of the bones of the face at this part.

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* London Med. Gazette for 5th April 1834, p. 32.

The extreme singularity of the circumstances of a case of this kind, which occurred in the practice of Mr Anderson of Selkirk, in so far as there was no wound of the cranium, has induced me to collect a few of the facts recorded on this curious species of injury.

On the 31st of July, J. M., aged 16, while fencing, received a wound in the right orbit from the point of a foil, provided with a button, which, however, was not covered. The instrument penetrated the lower eyelid, near its inner side, upon which he instantly fell down. About ten minutes after the accident, my son found him in a state of insensibility, his countenance pale, a cold perspiration over his body, pulse weak, and rather fluttering, breathing stertorous, with occasional vomiting. There was considerable ecchymosis round the eye, and a little blood oozed from the wound, which was about the size of the button on the end of the foil. By using the ordinary means, his body came to a more natural heat, and the pulse became a little stronger, and between 60 and 70. He swallowed with great difficulty a little wine and water.

About ten ounces of blood were taken from his arm, after which his pulse rose to 80, full and soft; his breathing became less stertorous, and by degrees quite regular; and natural heat was perfectly restored. Upon applying very strong ammonia to his nostrils, he moved his right arm, as if to put it away. The left side seemed from the first quite paralyzed. He continued much in the same state all the afternoon. Cold applications were constantly used on his head; an enema was administered, which operated very freely; and a large dose of calomel was given, which he soon vomited. About ten o'clock he got much worse, the breathing again became stertorous, and frequent convulsive motions of the right arm and leg took place. He was again bled to fifteen ounces, but with little or no effect on his pulse, which was still about 80. His head was shaved, leeches applied, and cold applications to it continued. He passed a very restless night, constantly tossing his right arm and leg, and his head going from side to side. He was now incapable of swallowing, and the attempt to put any thing down increased the convulsions. The following morning the symptoms still continued the same. Two drops of croton oil were put on the tongue, but without any effect; an enema again administered with very little effect; and a large blister applied to the nape of the neck, and between the shoulders. His pulse gradually fell to about 50, and continued nearly the same till he died. The other symptoms continued much the same all that day, (Thursday,) gradually increasing towards night, when the breathing was so laborious that it might be heard at a considerable distance, and the convulsions were very violent. He died about five o'clock on Friday morning.

On dissection the brain and its membranes were highly vascular, much distended with blood, and there was an effusion of serum in the ventricles, but not the slightest appearance of fracture or injury in the bones of the orbit. The wound penetrated in a slanting direction towards the supra-orbital plate, but which was not injured, nor was the membrane covering the brain in the least discoloured, as if it had been struck by the foil. The wound appeared to end among the cellular substances.

Mr Anderson inquires, was death caused by concussion, or is it to be attributed to a shock of apoplexy coming on at the moment? It may be mentioned, that the boy was of superior talents, and had a large head. The complete insensibility, (the power of swallowing remaining only for a short time,) the paralysis of the left side, and the subsequent convulsive movements of the right, would have led to the belief of pressure upon the brain, or severe injury to its substance. Dissection proved that this was not the case. Was it concussion? The thrust of the foil was aimed at the body, but the boy, either with a stick or his arm, warded it off, so that it slanted upwards and entered the orbit. The force with which the button was driven through the skin must have been considerable, though the direct violence was broken. In examining cases of wounds in the orbit, none can be discovered attended with similar circumstances. In all the bone was either fractured, and subsequent inflammation induced, or some instrument passed into the brain, or the violence was obviously sufficiently great to produce concussion.

The case of Henry II. of France, as related by Ambrose Paré, is a very interesting instance of the third kind of injury. Henry at a tournament received a stroke with a blunt lance on the breast, by the violence of which his vizor was thrown up, and the truncheon of the broken lance hit him above the left eyebrow, " and the musculous skin of the forehead was torn, even to the outer corner of the left eye. Many splinters of the said broken truncheon being struck into the substance of the fore-mentioned eye, the bones not being touched or broken, but the brain so moved and shaken, that he died on the eleventh day after the hurt. The skull was opened after death, and there was a great deal of blood between the *dura* and *pia mater*, at the middle of the suture at the hind part of the head, and there appeared signs, by the natural colour being turned yellow, that the substance of the brain was corrupted as much as one might cover with one's thumb. Which thing caused the death of the king, and not the wound of his eye; for we have seen many who have not died of far more grievous wounds of the eye."

An example of this is related by Paré in the case of Lord St John's, who was wounded in the tilt-yard by the splinter of a broken lance, of a finger's breadth and thickness, which passed through the vizor of the helmet, entered into the Orb, under the eye, and pierced some three finger's-breadth deep into the head. "By my help," says Paré, "and God's favour, he recovered.

"What shall I say," continues Paré, "of the wound of Francis Duke of Guise, who had his head so thrust through with a lance, that the point entering under his right eye by the nose came out at his neck between the ear and the vertebræ; the iron being left in by the violence of the stroke, which stuck there so firmly that it could not be drawn or plucked forth without a pair of smith's pincers. Yet this prince, by the favour of God, recovered. By which you may learn, that many die of small wounds, and others recover of great; yea very large and desperate ones."

Injuries in the orbit sometimes give rise to medico-legal discussion.

Wepfer * relates a case in which a man received a blow on the left eye with the fist while stooping down from bleeding at the nose. He was of intemperate habits; and, though next day he complained of pain in the eye, he continued to drink wine. On the fourth day he was delirious, and an epileptic fit came on. On the 6th day he died. On examination, the eye and the bone beneath had sustained no injury. The vessels of the brain were very turgid, and there was a considerable quantity of fluid between the *pia mater* and the brain. From the previous intemperate habits, the bleeding at the nose at the time of the injury, and the prevalence of fever at that period, Wepfer argues, that the blow was not the cause of death, but that he died of fever.

Wepfer mentions that the Romans used to kill their cattle by thrusting a knife through the orbit into the brain.

Garengeot † mentions a man who received a gun-shot wound, slight in appearance, on the upper eyelid. Some time afterwards he complained of shivering, took to his bed, and died. An abscess was found in the anterior part of hemispheres of the brain corresponding to the orbit.

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* Observations de affectibus Capitis.

† Operations de Chirurgie.

Morgagni mentions the dangers from wounds in the orbit; and in his fifty-first epistle quotes numerous cases from former authors, but says they are almost all imperfect from different causes,—such as that of Ruysch, who says nothing else but that in a short time after the wound, which seemed of very small moment, was received, death came on.

He alludes to three cases from Fantonius, Camerarius, and Nebelius, in which wounds in the orbit were followed by paralysis of the opposite side, the patients surviving.

The case given in his fifty-seventh section is interesting. It is that of a man in whom a sharp instrument passed between the eye and the orbit without injuring the eye, and entered the brain through the orbitar plate. For three days there was no sensible alteration of the animal functions. On the fourth he came himself into the Hospital, and on the same day he died. A small quantity of purulent matter was found between the *dura* and *pia mater*. The termination of the wound was distant only a finger's-breadth from the parietes of the left ventricle.

Another man was wounded with the point of a sharp sword about the lower margin of the orbit of the left eye. Complete insensibility, with slight convulsive motions, followed; and he died about ten hours after the infliction of the wound.

Upon inspection, it was found that the sword had passed into the brain, and that the ventricles were filled with blood.

In 1735, in some quarrel behind the scenes, the actor Mossop was killed by Macklin by a thrust from a stick; but I have not been able to discover any account of the nature of the wound.

The case of the girl given by Sir Astley Cooper, in the first volume of his Lectures, as published by Mr Tyrrell, and the following very interesting one by Dr Moir, which was seen by Professor Syme in its progress, are the most fully and accurately detailed instances of fracture of the orbit.

On Friday, 6th June 1834, when some boys were amusing themselves, one of them thrust the birch end of a scavenger's broom two or three times into the face of William Watt, a fine boy, aged 10. He was so stunned as to be obliged to lay down, and was conveyed home in a state of stupor.

On examining the eye immediately after the injury, his father observed a red spot on the conjunctiva of the left eye near the internal angle; but two hours after the accident, when first seen by Dr Moir, the eyelid was so swelled that it could not be raised to ascertain the nature of the injury. He was moaning much, and complained of violent pain in the eyeball and forehead.

A cold solution of acetate of lead was ordered to the eye, and a drachm of compound powder of jalap, which, with five grains of calomel, was repeated in the evening.

On the 7th the eye was enormously swollen and very livid. He had been delirious and restless during the night, and still continued so. At times he complained much of the pain in the eye and forehead. Face flushed; tongue furred and dry; great thirst; pulse 120, rather sharp, but not full; skin hot. Laxative had operated once very partially.

8th, Sunday. Much in the same state; had violent grinding of the teeth during the night, two of which, it was afterwards found, had been forced out of their sockets and swallowed; right pupil dilated, but sensible to the light.

9th, Monday. Still comatose, but capable of being roused; urine and feces passed involuntarily; otherwise as yesterday.

As, since the day of the accident, all other applications to the eye, except warm poultices, rendered him more restless and uneasy, and seemed to increase the swelling, these alone were continued. The head was shaved, and cold lotions constantly applied; a number of leeches were applied to the eye and temples at three different times; laxatives were very frequently repeated, owing to the great torpor of his bowels. During the 7th, 8th, and 9th, besides several enemata and house powders, consisting each of a drachm of compound powder of jalap, he had about one scruple of calomel, as much aloes, one drachm of gamboge, one drachm of scammony, and twelve drops of croton oil. Until the morning of the 9th, the bowels were only once opened, but they then began to give way, and were very freely operated on in the course of the day.

During the 10th and 11th, the general symptoms improved. The ball and vision of the injured eye were found to be perfect; the headach was less severe, but occasionally returned in paroxysms; the swelling of the eyelid was much reduced, and he was becoming more sensible; right eye natural; pulse less frequent, and skin cooler; began to take a little liquid nourishment.

The cold applications to the head, warm poultices to the eye, and strong laxatives were continued.

12th, Thursday. Was rather restless, and complained more of pain in the eye: skin hot, and tongue dry; pulse increased in frequency, but weak. Eight leeches were applied to the temples, and the other remedies continued.

On the 13th and 14th the symptoms became much aggravated, and the mental faculties were greatly oppressed; the right pupil was much dilated, and its sensibility to light impaired; had much pain in the back and belly, the latter of which was relieved by hot fomentations. Early on the morning of the 14th, he had convulsive motions of the arms, and was very restless, but as the day advanced he became comatose, and was so sunk that he was not expected to survive many hours. The left eyeball was very prominent, and left partially uncovered by the eyelids, and the conjunctiva much injected. As it was evident that matter had formed in the orbit, a bistoury was introduced through the upper eyelid by Mr Syme, and a considerable quantity of thin matter discharged, containing some flakes of lymph. The abscess was deep, and the bone ascertained by the probe to be denuded, a tent was introduced and withdrawn two or three times daily; small poultices were frequently renewed, and laxatives, and ablution of the surface with tepid vinegar and water, were prescribed.

During the remainder of this day, and the 15th, he gradually improved. The same kind of matter continued to be discharged in very considerable quantity. The coma wore off; the sensibility returned; the right pupil again became sensible to the impression of light, and the vision was restored. A blister was ordered to the nape of the neck, and occiput, in addition to the other remedies, which were continued.

From this time till Friday the 20th, he went on gradually improving. He completely regained the possession of his mental faculties; and said he felt better, and he began to ask for a little nourishment. On the 18th, he lay upon a sofa while his bed was making. On the 19th, the discharge, which had begun rather to diminish, changed its appearance, and poured out in immense quantities, having a most offensive smell. He had some beef tea, and the other remedies continued.

On the 20th, the pain had returned during the night; the countenance was flushed; and he had slight tremors of the superior extremities. He lay generally in a comatose state; but when roused answered questions distinctly. Right pupil was dilated; but vision still entire. Pulse weak and thready.

On the 21st, all the symptoms became aggravated, but still answered questions put to him; had slight convulsions, and occasionally slight strabismus. A cap blister was applied, and dressed with the *Ungt. Hydrarg.* Calomel, two grains every three hours.

22d. Passed a worse night, with almost continual *stridor dentium*. Though his vision was gone, he was still sensible, and distinguished his schoolmaster and others by their voice. Right pupil was largely dilated; and he was affected with strabismus, general tremors, and floccitation.

Pulse 100, weak. Discharge from the eye as copious and offensive as ever. Ordered by Mr Syme gt. x. tincture of digitalis every three hours, and calomel was continued.

23d. Had no sleep, and was generally convulsed early in the morning, after which he was quite insensible; had universal tremors, *subsultus tendinum*, and constant motion of the left extremities. No pulse at the wrists, but swallowed anything put into his mouth. At near ten the mucous rattle commenced. At half-past ten hemiplegia of the left side took place, and soon after the power of deglutition ceased. Terrible *stridor dentium* supervened for a few minutes, followed by low moaning, till death relieved him of his suffering, at half-past eleven, seventeen days after the occurrence of the accident.

Inspection.—On removing the scalp and pericranium from the skull, a large quantity of serum, tinged with purulent matter, was found infiltrated under it, connected with the effects of the blister. Nothing peculiar was observed upon the superior surfaces of the membranes of the brain, except that the arachnoid was rather drier than usual, and on the right side there were slight opacity and effusion of lymph at two small spots. Upon raising the brain gently from before backwards, an adhesion of its substance to the *dura mater* was observed, corresponding to an opening in the left orbital part of the frontal bone, about half an inch posterior to its internal angle. The cerebral matter adhered only round the edge of this opening, forming a communication between the cerebrum and orbit, and when the adhesions were torn across a quantity of matter escaped from it. There was an extensive deposit of lymph and purulent matter over the centre of the base of the *cerebrum*, enveloping entirely and obscuring the origins of the first, second, third, fifth, sixth, and seventh pairs of nerves; and a considerable quantity of pus issued from the vertebral canal.

The olfactory nerve of the left side was pushed aside towards the mesial line, and at the anterior part of the bulb, was, along with a small part of the brain adjoining to it, dark-coloured and softened. The left side of the base of the *cerebrum* was softer and more prominent than the right, and communicated the sense of fluctuation.

An incision was now made into the anterior corner of the left lateral ventricle, extending through the artificial opening before spoken of, and carried backwards. The ventricle thus laid open contained at least three ounces of pus, of a most putrid smell, besides what had been lost previously; and the parts containing it were quite broken down and disorganized. There were scarcely any remains of the *corpus striatum*. The fornix was entire, but very much softened, and the *plexus choroides* of a dark livid colour. The abscess anteriorly was not limited to the ventricle. In the right lateral ventricle there was a small quantity of pus, the contents were somewhat softened, but not disorganized as in the left.

The *dura mater* being now stripped off the left orbital plate, this membrane was found perforated, and around its edges portions of cerebral matter were found adhering, as also a small piece of the orbital plate. A specula was also partially separated from the orbital plate, and projected upwards.

The orbital plate and superciliary ridge being removed, the upper part of the contents of the orbit was one mass of disorganization, including the *rectus superior*, and *obliquus superior* muscles; but on dissecting downwards, the optic nerve and eyeball were untouched and healthy, as likewise all the parts within the orbit not immediately connected with the line of injury, and the consequent fistulous passage for the abscess.

ART. XI.—*Report of Cases communicated to the Anatomical Society of Edinburgh.* Edited by JOHN G. M. BURT and ROBERT SPITTAL, Fellow of the Royal College of Physicians, Edinburgh, Secretaries.[*]

Case of Tumour in the Left Hemisphere of the Brain.—Dr Moir exhibited a portion of diseased brain taken from the subject of the following case. On the 20th April 1833, Mrs P. aged about 60, complained of pain in the region of the stomach, nausea, and occasionally of slight headach and anorexia. Her tongue was foul, and bowels rather constipated. Pulse natural. Some improvement took place in the latter symptoms; but the headach and nausea continued much in the same state until the 4th of May, when she was attacked with partial paralysis of the right side. From this time she gradually lost the faculty of expressing her ideas in proper language; using sometimes words conveying a meaning quite different from what she intended, at other times being totally at a loss for the word she wanted. She was at the same time quite aware of the defect, and seemed pleased when any of her friends discovered what she wished. She did not possess the power of speech for the last three days of her life, but seemed aware of what was going on around her, and knew her friends. She died on the 26th May. On examination after death, the upper and middle part of the left hemisphere of the brain was soft, and communicated the feeling of fluctuation to the fingers. Upon being cut into at this part, a cavity was found close to the surface, containing cerebral matter softened down to the consistence of pus; and projecting upwards from the cavity, a tumour of the size of a large cherry, of a dark dull-red colour, and of firm consistence. The cerebral mass forming the walls of the cavity was in a state of ramollissement. A similar tumour and cavity were found at the posterior and under surface of the posterior lobe of the same side.

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[*] The Anatomical Society of Edinburgh was formed in March 1833 for the reception and discussion of such cases of morbid anatomy, and of such rare and anomalous cases of healthy anatomy, either of the animal or vegetable kingdoms, as might occur in the experience of any of its members. Its meetings are held once a fortnight; and the following report contains a portion of the cases communicated.

On this case Dr Moir remarked, that it has been supposed by many that there is an intimate connection between the anterior lobe of the brain and the faculty of language. In the Lancet of June 8, 1833, Mr Browne adduced in support of this opinion, from various authors, the proofs obtained from pathological anatomy. These he divides, 1*st*, into those cases in which the faculty of language was impaired in consequence of external injuries involving this part of the brain alone; and *2dly*, into those in which similar effects followed internal disease seated in the nervous tissue. The present case, however, and that of the boy Watt, noticed above, seem to lead to very different conclusions, or, at least, to show that the said connection does not hold good in all cases. In the case of the boy Watt, notwithstanding the external injury and subsequent very extensive internal disease of the anterior lobe of the brain, he retained the faculty of language to within two days of his death, and repeatedly named individuals who came to see him. Again, Mrs P. lost the faculty of expressing her ideas, though not of speech, and could not mention the names of her friends though she knew them. In her case there was no diseased structure in the anterior lobes; but, on the contrary, of the superior part of the hemisphere and posterior lobe of the brain.

Tumour in the Right Corpus Striatum.—Dr Spittal exhibited the portion of brain containing the morbid mass taken from the subject of the following case. A. M., a boy aged 2½ years, reported to have been in a very healthy state during the first nine or ten months of his life. Since that period, however, according to the account of his mother, he had been always a weakly child. He has never been able to articulate above one or two words, his usual method of expressing his wishes having been by a species of muttering, which his relations by-and-by came partially to understand. On inquiring concerning his intelligence, his mother remarked, that he was "very quick;" indeed, according to her account, sometimes "too quick," in understanding what was said or done. This statement, however, may have been dictated somewhat by prejudice, and in contrast to his bodily infirmities, although it was stated, that he was so when compared with others of the same family who were in good health when at the same period of life.

He was able to walk with some assistance, but was observed to use his right lower extremity as one whose limb is partially paralytic, throwing it down as it were. He was not subject to "fits" of any kind; nor did he make any particular complaint until within a few weeks previous to death. About this time he began to lose flesh, and was unable to sit up; his sleep became disturbed, with moaning, starting, and screaming; and he was frequently observed to put his hands to his head, as if he felt uneasiness there. He also had occasional vomiting, and other febrile indications. These symptoms continued to increase until within a few days of his death, when he was seized with severe and frequent convulsions of the right, upper, and lower extremities, particularly the former, in which, during these, the *extensors* of the wrist were in very strong action, so that the back of the hand was much drawn over towards the arm. About this time he ceased to "speak," as his muttering was termed. He was somewhat comatose, and his intelligence was nearly gone. The right pupil was very much dilated, the left only partially so; and neither were affected by the light. The convulsions continued, the coma became complete, and he died, the latter symptoms having lasted about five days. His head was somewhat larger than usual, and considerable superficial veins were observed in the scalp. The skull was ossified, with the exception of the anterior fontanelle.

Sectio Cadaveris thirty-seven hours after death.—*Head.*—The upper surface of the brain was much drier than usual, and the convolutions were very much flattened. On the lower surface this was not so much observed; and over the surface of the *cerebellum* there was a thin layer of a purulent-looking fluid, as if that body had been dipt in pus. The arachnoid membrane and subcellular tissue in the neighbourhood of the optic commissure were thickened and firm. About four ounces of serous fluid were found in the lateral ventricles; and on the arachnoid membrane lining them there was a minute granular layer of lymph firmly adherent. A tumour of a tubercular character was observed to project into the right lateral ventricle. It was imbedded in the anterior part of the right *corpus striatum,* was of a firm texture, of a yellowish hue, and about the size of a walnut. The substance of the brain around was quite of the usual appearance, and not softened.

It should have been mentioned above, that the bones of the upper part of the skull were not united at their sutures, and that the sagittal was nearly a quarter of an inch in breadth, and filled up by a fibrous membrane.

April 22, 1833.—The head alone was allowed to be examined.

Case of Apoplexy.—Dr A. D. Maclagan showed a portion of the brain of a woman, aged 64. The right *corpus striatum* was completely broken up, with about two ounces of coagulated blood in the anterior cornua of the ventricles. The coats of the cerebral arteries were diseased.

The patient was of temperate habits, and not plethoric, and had been seen by Dr Maclagan some months before death, on account of slight derangement of the bowels. About four days before death, Dr Maclagan was again called, and found, that while moving across the room she had fallen down in a fit, and was totally insensible; the pupils were closely contracted and immoveable. Her breathing was slow, but without stertor; and the pulse slow, labouring, and full. She had not much distortion of the face, but it was quite perceptible; and she had complete hemiplegia of the left side. She occasionally lifted her sound arm to her head, as if she had suffered pain there. She was treated in the usual way, and died without convulsions, having survived the attack four days.

Injury of Brain from perforation of Orbital Plate.—Dr Moir exhibited a portion of the orbital plate and *dura mater* of the boy Watt, showing the perforation which had taken place in these parts, consequent upon thrusting a scavenger's broom into the boy's face. For an account of this case, see Dr Scott's paper, page 363, where, for the sake of arrangement, it is published, by permission of Dr Moir, and the consent of the Society.

Caries of Temporal Bone.—Dr Reid exhibited a temporal bone in which *caries* had broken up the whole of the cavity of the tympanum, part of the mastoid cells, and had begun to encroach on the labyrinth. A portion of the posterior surface of the *dura mater*, equal at least in size to a sixpence, and nearly half an inch of the *portio dura* nerve, where the Vidian joins it, were exposed to the contact of the external air, which of course passed freely into this excavation made by the disease, and yet both these parts and the brain appeared perfectly healthy. Symptoms unknown.

Disease of the Heart.—1. Dr Henderson exhibited a specimen, in which there was great eccentric hypertrophy affecting principally the ventricles, with narrowing of both orifices on the left side of the organ,—a state of disease which was detected readily several months before the patient's death. Under the influence of repose, depletion, and spare diet, the *bruit de soufflet*, which attended the ventricular contraction, and the violent impulse against the parietes of the chest, had *completely subsided* many weeks before death. The only symptoms which remained were slight dyspnœa, hydrothorax of right side, and irregular pulse.

2. Dr Henderson also showed a specimen, in which there was considerable dilatation of all the cavities of the heart, with hypertrophy of the left auricle and ventricle. The left auriculo-ventricular opening was so much contracted from cartilaginous degeneration and adhesion of the portions of the mitral valve, as barely to admit the point of the finger. The pulse, as is usual in such disease of the mitral valve, had been extremely small and very irregular. The sounds of the heart's action had been surprisingly perfect, having been only slightly diminished in intensity, and unattended by the least approach to morbid bruit.

3. Dr Henderson exhibited another specimen with a state of general disease of the heart, nearly similar to the last case, but with less narrowing of the left auriculo-ventricular opening. This case was remarkable from having been totally free from morbid sound.

4. Dr Henderson likewise showed a heart in which there existed dilatation of both ventricles, from a middle-aged female. The pericardium adhered firmly to nearly the whole surface of the auricles, and a considerable space in the vicinity of the adhesion was covered with rough patches of hard granular-like lymph, apparently of no recent date. Dr Henderson stated, that, about five months before death, she had been affected by the symptoms usually attributed to pericarditis, which were removed in the course of two or three days by general and local bleeding. She continued subject, however, to difficulty of breathing, to which she had been

previously liable after any unusual exertion; and for some weeks before her death, the dyspnœa had been excessive, and the organic disease described sufficiently obvious. During the attack of pericarditis,—the existence of which, at a considerable distance of time before death, the subsequent inspection placed beyond doubt,—there was not the least approach to the rough sound or the *craquement du cuir* mentioned by M. Collin and Dr Stokes; a circumstance not explicable, on the supposition that accumulation of fluid had occurred in the pericardium, for no extended dulness of percussion could be detected, nor any morbid phenomenon in the region of the heart indicative of the existence of fluid; but probably arising from the inflammatory deposition having been confined to the region of the auricles, in which situation friction, on which the above morbid sounds are presumed to depend, during the ventricular action, must be very trifling, if, indeed, there exist any.

Dr Reid exhibited the *heart of a pig* in which a rounded *fibrinous tumour*, about the size of a small strawberry, occupied the left auriculo-ventricular opening. It adhered to the valve and upper part of the ventricle, and projected upwards into the auricle, reducing the auriculo-ventricular opening to a mere slit, overlapped by a valvular portion of the tumour. The left auricle was greatly dilated, and much thickened. The animal was only four months old, and had been affected with cough and difficulty of breathing for nearly a month.

Dr Reid also exhibited a specimen in which there existed *obliteration of the vena cava superior*, as it entered the auricle in the human heart. The manner in which the blood from the head and superior extremities reached the heart was indicated by the increased size of the intercostal veins and the *vena azygos*, which had evidently served to transmit the fluid, whose proper channel had been obliterated. The patient died of disease of the kidneys with dropsy. There were no symptoms indicating disturbance of the circulation, for several weeks at least, before death.

Effusion of Lymph in Larynx, Trachea, &c.—Dr Henderson presented a larynx, trachea, and portions of the bronchia taken from a man, aged 27, who had died during the eruptive stage of small-pox. The mucous membrane even of the minute ramifications of the bronchia, as well as of the more considerable parts mentioned, were covered with coagulable lymph, easily scraped off with the scalpel, and disposed in irregular areolar patches. The lungs were thickly studded with small apoplectic-like masses, and generally engorged with blood. Copious bleeding from the arm had been practised before the eruption appeared, but without apparently checking the extent or the violence of the pulmonary oppression. He had not been vaccinated.

Cases of Phthisis.—1. Dr J. H. Balfour exhibited a lung studded with tubercles, taken from a child aged 6 years, who had for several months been affected with the usual symptoms of phthisis. Both lungs were studded with tubercles. The spleen, which was also shown, was full of tubercles. The bronchial glands from the same patient were greatly enlarged, and contained tubercular matter. The mesenteric glands were also much enlarged, and the surface of the liver was covered with tubercular deposits. The kidneys were healthy.

2. Dr Malcolm showed a portion of the lungs, spleen, liver, and enlarged mesenteric glands of a child aged 4 years, who was reported to have laboured for about eight weeks under infantile remittent fever. When Dr Malcolm first saw the child, it was in a very emaciated condition, and suffering from bronchitis. From this it was somewhat relieved, but gradually sunk and died.

Examination after death. The *pleura pulmonalis* was entirely covered with miliary tubercles, and the whole parenchymatous structure was found studded with these bodies; and this was the case not only in the upper part, but also in every other part of these organs.

The mucous membrane lining the bronchial tubes was of a vivid red colour, and a purulent-looking fluid issued from the bronchiæ. Several small tubercles were scattered over the peritoneal covering of the liver, some of which were in a soft state as though they had been recently deposited. These could easily be scraped off, leaving a small indentation. The internal structure of the liver was healthy.

The spleen was thickly studded with tubercles.

The mesenteric glands were enlarged. A few small ulcers were found in the colon, and cicatrices of others were observed.

The kidneys exhibited a mottled appearance,—having several white patches over their surface. There did not appear to be any change of structure, however, the white marks on the surface not extending into the substance of these glands.

There was much dilatation of the left ventricle, but its walls had retained their usual thickness. The heart was otherwise healthy. The obstruction to the free passage of the blood through the lungs would have led us to expect dilatation of the right ventricle of the heart rather than the left. The fact of the semilunar valves and other portions of the aorta being sound, render this occurrence more remarkable.

3. Dr Spittal exhibited a lung containing a very large tubercular cavity, in which the amphoric resonance had been very distinctly perceived during life. For the following history of the case, Dr Spittal stated he was indebted to the kindness of Dr P. S. K. Newbigging, with whom he had visited the patient during his last illness.

David Paterson, aged 36, was attacked in March 1832 with symptoms of pneumonia, from which, however, he recovered, and under moderately full diet, &c. was rapidly gaining strength, when, about the end of August, whilst training a young horse, he felt something give way in upper part of the right side of the chest, which was followed by expectoration of blood, repeated at intervals of some hours for two or three days, but which was subdued by copious blood-letting. About the latter end of September, his symptoms were as follow, viz. frequent cough, with pituitous expectoration; slight pain in right side on coughing, and cannot lie on that side; at the upper part, and indeed throughout the whole of right side, percussion emits a dull sound. Respiratory murmur is absent on right side; natural on left; pulse 90; appetite good; tongue and bowels natural; sweats little; is emaciated and weak.

19th November. Continues easy; cavernous râle heard below the right clavicle to the fourth or fifth rib extending into the axilla. Pectoriloquism is also distinct; expectoration mixed with pus; and feels a sensation as of its issuing from the upper part of right lung.

29th December. Continues free from uneasiness; appetite good; pulse 96; tongue and bowels natural; sound on percussion rather clearer below the right clavicle, dull in lower part of chest; cavernous gurgling heard lower down; a peculiar buzzing or amphoric sound is heard between the fourth and sixth ribs, at the anterior part of the chest; expectoration copious and purulent.

February 1st, 1833. Cough less urgent; otherwise the same as before. On applying the stethoscope, the peculiar sound before mentioned was at once discovered, especially after coughing, when it imparted to the cavernous râle an amphoric character, arising from the bursting of air-bubbles in a very large cavity.

March 21st. Died this morning after a violent fit of dyspnœa, and difficulty of lying in the horizontal posture. The amphoric sound could not be heard during the fifteen or sixteen days previous to death.

Examination after death.—The whole of the upper part of right lung was adhering, by means of its pleura, to that of the parietes of the chest; the unattached surface was covered by a deposition of soft lymph, easily separated. A very large cavity existed in the upper part of the right lung capable of containing from a pint and a-half to two pints of fluid, and when cut into contained between two and three ounces of purulent fluid. The walls of this cavity were generally smooth.* There was extensive deposition of tubercles in the lower lobes of this lung, and tubercles in different stages existed in the left lung. The heart was sound, with the exception of the right ventricle, which was slightly hypertrophied. The pericardium contained three ounces of serum.

The liver was large, pale, and softer than usual. The other viscera were healthy.

Dr Omond exhibited a *diseased stomach*, in which *perforations* had occurred in two places, the one a circular opening with the surrounding mucous tissue slightly ulcerated,—the other was of irregular form, the edges of the aperture being thickened and hard. The patient was a middle-aged female, who had suffered long from stomach complaints. No severe illness had occurred before the fatal attack, which was attended with fainting, sickness, and pain referred to the spot. The nature of the disease was conjectured before death, which took place in twelve hours.

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* This specimen is now in the museum of the Royal College of Surgeons of Edinburgh.

Solution of Stomach.—Dr A. D. Maclagan exhibited the stomach and lung taken from the subject of the following case. The patient was a child, 18 months old, who had for some time laboured under symptoms of hydrocephalus. By an imprudent exposure to cold, pleuritis was induced, which proved fatal.

Examination after Death.—There was a considerable effusion of serum below the arachnoid, on the surface of the brain, filling up the spaces between the convolutions, also a little in the ventricles. The *pleura pulmonalis* of the right side was covered with an effusion of recent lymph. In the cavity of the left pleura there was a considerable quantity of a dark-coloured fluid, the nature and source of which could not be at first ascertained; but an explanation was obtained on continuing the dissection farther. The cardiac end of the stomach and the termination of the œsophagus were destroyed, and in the diaphragm, towards the left side, there was a round hole larger than a shilling, with soft ragged edges, through which the fluid, which manifestly had been the contents of the stomach, had made its way into the cavity of the left pleura. The serous membrane was removed from the lungs and thoracic parietes as if by a corrosive fluid.

Enlarged Gastric Glands.—Dr Allen Thomson showed the stomach of a young man who had died after a short illness subsequent to a surgical operation, in which the small prominences called gastric glands were much enlarged and more numerous than usual. These glands occupied principally the portion of the stomach surrounding the cardiac opening and the small curvature. They presented to the naked eye the appearance of a number of thickly set eminences on the surface of the mucous membrane, each having a red point in the centre. On examining them with a magnifying glass, each gland was found to have six or eight openings on the most prominent part, disposed in a radiated manner, and the red point seemed to be produced by the colour of the blood in the subjacent cellular texture being seen through the openings of each gland.

Excessive Prolapsus Ani.—Dr Taylor exhibited a specimen of *prolapsus ani* occurring in a boy six years of age, of a scrofulous habit of body, very much deformed, and who, it was said, had been from infancy liable to slight attacks of prolapsus, but which, till this last, had been easily reduced. When first seen by Dr Taylor, February 20, 1834, there was a protrusion of about six inches of gut, of a bright cherry-red colour, much swollen and œdematous. It had prolapsed six days previously, and the patient had been suffering for ten days under severe diarrhœa, which still continued, with frequent slimy discharges, and much tenesmus. The skin was dry and hot; pulse quick; tongue furred; no pain of abdomen. Any attempts to reduce the intestine were unavailing, both owing to its great swelling, and the severe straining of the boy, who complained much, and said he felt a great desire to go to stool whenever the gut was handled; besides, the very relaxed and distended condition of the sphincter gave little hope, even if the gut could have been reduced, of its being retained; more especially, as long as what appeared to be the exciting cause, viz. the diarrhœa, continued. In the hope of checking this, the usual remedies were prescribed. Next day the diarrhœa was unabated; rather more intestine protruded, very much swollen, and of a dark-red colour.—22d. Bowel complaint much the same, and there is now fully nine inches of gut down; appearance much as yesterday.—24th. Intestine more swollen, and here and there ash-gray coloured sloughs. From this period no more intestine protruded; the sloughs extended; several dropping off, discovered a dark livid base. The boy was now evidently sinking, and he died on the 29th.

Sectio.—On opening the abdomen, the small intestines appeared in their natural position, but on laying these aside, the cœcum was discovered dragged out of its natural situation and towards the left side. The colon was very much contracted and thickened, and on tracing it, no sigmoid flexure could be perceived, the whole of it seeming to have passed through the rectum, which was itself completely everted, not a vestige of it being within the anus. The mesenteric glands were also much diseased. Dr Taylor having placed the preparation at the disposal of the Society, it was presented to the museum of the Royal College of Surgeons.

Dr Balfour exhibited the left kidney of a shoemaker, aged 62, who had for a long time been affected with pain and difficulty of micturition, and who ultimately died comatose, having recently laboured under suppression of urine, combined with slight peritonitis. The kidney contained numerous hydatiform cysts filled with a serous fluid, some of them of the size of a small orange. The right kidney also presented similar cysts of smaller size.

Ulceration of the Bladder.—Dr Taylor exhibited a specimen of ulceration of the bladder, taken from the subject of the following case. Robert Proven, æt. 4½, much emaciated. An opening about the size of a large pin head was observed just behind the scrotum, where it joins the perineum, and close by the raphé. On introducing a probe into this opening, it passed about an inch in all directions; he was reported to have been voiding his urine from this opening for the last three weeks, as well as by the urethra; while passing it, he appeared to suffer much pain. On pressing with the fingers in the neighbourhood of the above-mentioned opening, a clear fluid resembling urine can be squeezed out. It is also stated that a small tumour sometimes formed there, but disappeared again after the urine was voided.

This child was first seen about six months ago, on account of severe and frequent attacks of convulsions; from these he recovered in a short time; but a tumour then began to appear in the perineum, which gradually increased in size, and was soon discovered to contain matter. An opening was made into it, and a good deal of pus discharged. In the course of a week the discharge had almost ceased, and the child appeared to be doing well. After a lapse of some time, Dr Taylor was again called, when the appearances above-mentioned presented themselves. On inquiry, he found that the discharge from the abscess had, although nearly, never entirely ceased; and that it was about three weeks previous to Dr Taylor's again seeing him that a watery fluid was first seen to issue from the aperture. For about four weeks he continued much in the same state; but at the end of that period, the urine ceased to flow from the urethra, and passed entirely by the opening in the perineum, till the time of his death, which took place about three weeks thereafter.

On dissection, the bladder, a portion of the penis, and the parts occupied by the abscess, were removed from the body. The cavity of the abscess presented a rough ulcerated appearance, and involved the membranous portion of the urethra, which was almost completely destroyed. The neck of the bladder was one mass of ulceration; and the fundus was almost entirely covered with patches of ulceration of an oblong shape, varying in size from about a quarter of an inch to an inch in length, with raised, ragged, and highly vascular edges. The urethra was pervious, and a catheter passed from it into the abscess, and from that directly into the bladder.

It seems very probable that ulceration had taken place from the original abscess into the urethra. Whether the great ulceration in the bladder was only consequent to that, or had begun previous to it, is difficult to say. No distinct account of the case from the friends of the child could be obtained, except that he had been always weakly, and that they had never remarked any symptoms of disease of the urinary organs.

Dr Moir exhibited a specimen of *Polypus uteri*, removed from a lady, aged about 45, who underwent the same operation six or seven years ago. The polypus then removed was of a very soft consistence. Her health since has been tolerably good. On examination through the parietes of the abdomen, the uterus was felt enlarged to the size of more than two fists. For some time previous to the present operation, she had suffered much from hemorrhage from the surface of the polypus, which protruded from the uterus into the vagina. A silver wire was placed round it as high as possible, and tightened every day for eight days, when the tumour dropped off. The hemorrhage has not returned, and she enjoys her usual health. Before operation, it was supposed that the polypus was of a malignant nature, but upon laying it open it was found to be of a fibrous vascular nature, and fleshy consistence. The surface from which the blood had escaped was rough. The part cut through by the ligature was about an inch and half in diameter.

Dr Moir likewise exhibited two *ovaries*, obtained from a woman who died in the General Lying-in Hospital in June 1834, of an epidemic fever, with which only three were seized, all of whom died;—the fever was similar in every respect to one that occurred in the latter end of 1832, when sixteen patients died in the course of a few weeks. Shivering generally preceded the attack; after which the pulse rose to 120, 140, or 150, but weak. Pain of the abdomen existed, principally in one or both iliac regions; and vomiting towards the termination of the complaint, with anxiety of countenance, and in breathing. Such were the principal symptoms. There was occasional headach; and in most cases the lochia continued.

The morbid appearances were generally some of the effects of inflammation of the peritoneal coat of the intestines. Effusion of sero-purulent fluid, to a greater or less extent; in every case the result of much inflammation of the uterine appendages, sometimes in one, but oftener in both sides, was observed. Sometimes the ovaries were covered by a deposition of lymph, and, except in one or two cases, they were enlarged and much softened; occasionally to such a degree, that on the least handling they broke down. On cutting into the broad ligaments, at the side of the uterus, purulent fluid was discovered; which, upon more minute examination, was found to be in the lymphatics of the broad ligaments.

Some plates have lately been published in Paris by M. Cruveilhier, taken from the appearances observed in La Maternité, in patients who died of a similar epidemic (in 1830 and 1831 ?), and which represent most exactly the appearances described above. All methods of treatment seem to have been equally unsuccessful in that hospital as in Edinburgh Lying-in Hospital.

Displacement of one of the semilunar Cartilages of the Knee-Joint.—Dr Reid exhibited a specimen of displacement which seemed to correspond to the affection of the knee-joint described by Mr Hey, under the title of Internal Derangement of the Knee-Joint, and by Sir Astley Cooper, in his Surgical Essays, under that of Partial Luxation of the Thigh-Bone from the Semilunar Cartilages; but no dissections are given by either of these two surgeons.

The fibrous tissue connecting the outer margin of the external semilunar cartilage to the edge of the head of the tibia was torn through in its anterior half, and the semilunar cartilage was found thrown inwards and backwards, and placed between the spine of the tibia, posterior crucial ligament, and posterior ligament of Winslow. The transverse ligament was entire. The cartilage itself was considerably flattened and broader, and the remaining portion of the fibrous tissue, connecting its outer margin to the tibia, was much thickened, and had assumed somewhat of a fibro-cartilaginous appearance. The cartilage of incrustation on the anterior part of the tibia, which had been exposed to the free motion of the condyle of the femur, had become rough. The motions of the articulations seemed sufficiently free, as far as could be judged of in the dead body; but it can be easily perceived that when the connecting parts are less extensively torn than in the present case, or when the posterior ligament has been rendered tense by the action of the muscles in walking, that the cartilage may be forced between the condyle and spine of the tibia, producing the same effects as the presence of a loose cartilage within the joint. The history of the case could not be traced. The man died in the Infirmary, and while there never complained of his knee, nor did the nurse remember to have observed any limp in his walk.

Case of general Alopecia.—Dr Spittal introduced to the notice of the Society a man, aged 40, who had been under treatment for *cynanche tonsillaris*, which ran its course rapidly to suppuration. This individual, about two years previously, had entirely lost the hair of his whole body, it having gradually fallen out during the space of six months, without any concomitant disease, and he has since enjoyed good general health. He was of fair complexion, with blue eyes, and the father of a numerous family, the youngest of whom was little more than a year old. Professor Frank relates a somewhat similar case, referred to by Dr Mason Good.

Mr Liddell exhibited a specimen of a remarkably *malformed chicken*, which had been hatched in the usual way, but was dead when discovered. The head, neck, and dorsal part of the vetebral column of this animal were single, the lumbar and posterior part of the vertebral column, the wings, pelvis, and legs were double. Both sets of extremities appeared equally perfect. On opening the animal, the heart, liver, stomach, and a small part of the duodenum, were found single; the genito-urinary organs, and the rest of the intestine, completely double.

Dr Allen Thomson exhibited some other specimens illustrative of the various degrees in which similar *duplex malformations* are found.

1. The skeleton of a *kitten*, in which the malformation was very nearly to the same extent as in the instance just mentioned. The vertebral column, from the back downwards, the pelvis, and posterior extremities, were completely double; and between the shoulders there projected upwards the rudiments of two supernumerary anterior extremities conjoined into one.

2. The skeleton of a *chicken*, with the conjoined rudiments of the posterior extremities projecting upwards from the sacrum.

3. Another specimen of deformity of the same nature in a full grown *goose*, which Dr Thomson had dissected in the recent condition, and which presented a remarkable instance of curvature of the spine.

Dr Thomson mentioned another instance very similar to No. 3. occurring in a full-grown domestic cock, which he had also dissected in the recent state. In this case, there was a double anus, and three *cœca* attached to the lower gut, instead of two as usual.

The bones of the supernumerary part were considerably more perfect in the cock than in the goose, but were not furnished with so many or powerful muscles. The blood-vessels and nerves were large in both.

Dr Thomson then exhibited a very rare and interesting preparation of the double embryo of a goose at a very early period of fœtal developement. This embryo is about a third of an inch long. The head, spinal column, and rudiments of the anterior and posterior extremities of each embryo may be distinctly seen with a magnifying glass. The embryos lie across one another, and in the angle between them is situated the heart, which appears to be single. They were situated on a single yolk, and are preserved, attached to a common vascular area, in which there are omphalo-mesenteric arteries belonging to each fœtus, but only one *sinus circularis.*

ART. XII.—*Supplement to the Annotation on Art. XI., in last Number, on Bronchitis from the presence of Foreign Bodies in the Windpipe.* By DAVID CRAIGIE, M. D., F. R. S. E., Fellow of the Royal College of Physicians, Physician to the Royal Infirmary, and Lecturer on Clinical Medicine and the Practice of Physic.

SINCE the publication of last Number, a great and favourable change has taken place in the case of the little boy, (No. 5, p. 106,) communicated to me by Dr Scott. It was then not perfectly certain whether a piece of walnut had been allowed to slip into the windpipe; and Dr Scott was obliged to trust to the imperfect history of the case, and the actual symptoms, in framing any conclusion regarding the cause of these symptoms, and their mode of removal. On the one hand, it was uncertain whether any foreign body was lodged in the bronchial tubes, and, consequently, the propriety of any operation for attempting its removal was very questionable. On the other, the symptoms were more urgent and severe than could be expected from mere spontaneous *bronchitis*, and were, at all events, anomalous. A few days after the case was published, some alleviation of the symptoms took place, and a foreign body was eventually coughed up by expectoration.

Of this occurrence I received the following account from my friend, Dr Scott, in whose words I now communicate the termination of the case.

"MY DEAR SIR,—I am happy to inform you of the result of the case of H. S., alluded to at page 106 of the last Number of your Journal, in which it was stated that there was reason to suspect that a foreign substance was lodged in one of the bronchial tubes. About ten days after the case was communicated to you, the patient was one morning seized with a violent fit of coughing, threatening suffocation. After a few minutes, a quantity of puriform mucus was suddenly ejected, along with a piece of the kernel of a walnut, a figure of which is enclosed. It was quite firm, and unaltered in its appearance. The quantity of puriform mucus was fully three-quarters of an ounce.

"I may mention, that, for four days previous to this occurrence, the boy's health seemed to be improved. The cough was less troublesome, the fever abated, the appetite was better, and there was less of the look of anxiety and distress he had formerly worn. His recovery has been complete. For a week there was cough and expectoration, but both gradually diminished, and at length disappeared; and he is now strong and healthy.

"This case, along with others of the same nature, show us how much may sometimes be entrusted to the efforts of nature. In the present instance, independently of our ignorance of the nature of the substance, there were almost insuperable objections to tracheotomy; and, from some circumstances in his constitution, it could not have been performed without great danger. He had previously suffered much from hooping-cough, in which convulsive fits came on, and was only convalescent from measles, during the course of which his recovery was very doubtful, from the severity of the bronchial symptoms. In the present instance, the appearances were very threatening; and though I was at times inclined to think that tracheotomy should be, at all risks, performed, I was happy to have the sanction of Dr Abercrombie's opinion for delay.—Yours very truly,

"3, *Dundas Street.* JOHN SCOTT."

I was in hopes of having added to the cases already published one of a very interesting nature, from a distinguished professional friend at some distance. But this, unexpected delay has, in the meantime, prevented. I think it, however, a good opportunity to subjoin from J. Baptist Borsieri, another case, which I regard as highly interesting, in which the foreign body was, as in two of the cases already mentioned, a molar tooth, and in which its presence in the bronchial tubes had given rise to the same train of symptoms as those already mentioned in my Annotation on the case of Dr Donaldson. The preliminary remarks and the treatment show that the peculiar circumstances of cases of this kind had made a deep impression on the clear and judicious mind of the Italian physician.

"Foreign bodies which have slipped into the *fauces* and stuck there are, if visible, extracted by forceps, or the hook, or may be thrust down into the stomach by the whale-bone or wax probang; or, by means of oleaginous, adipose, or mucilaginous applications, the passages are so lubricated that they effect their own transit downwards. Spines or other sharp bodies, when fixed, if they can neither be extracted or pushed downwards, induce inflammation, and require blood-letting. Suppuration having at length taken place, they either fall downwards or are brought upwards; and there are even instances of persons, who, by vomiting, have rejected bodies thus introduced. But, if they be sharp and firmly fixed, it is to be apprehended, that they are fixed more forcibly and deeply.

" The case is still more difficult when the foreign bodies have entered into the windpipe or the bronchial tubes. For then they either, by immediately interrupting respiration, prove fatal, or they induce long-continued diseases of the lungs; and it is a rare occurrence that they are expelled by coughing, and ejected by the mouth.

" I had occasion to see a slender girl of 10 or 12 years of age, and of a slight person, in whom the first molar tooth, extracted by a surgeon, had unfortunately slipped from the forceps into the throat, and been carried into the *glottis*, so that the patient narrowly escaped suffocation. After the lapse of some hours, however, during which was an agonizing struggle with death, when the tooth had passed the narrow region of the larynx, and been carried further down the windpipe, the patient began to feel more easy, being distressed only by a very harassing cough, and constant wheezing and *rhonchus*.

" I recommended that she should take from time to time teaspoonfuls of an oleaginous *linctus*; that she should frequently sip a tepid emollient decoction, and should inhale, at least twice daily, the vapour of hot water; and that, if any intense symptoms, as pain, spitting of blood, fever, or violent cough should ensue, she should lose some blood. The latter measure became once necessary several days after, in consequence of a sort of pleuritic pain, and the occurrence of fever, with harsh cough and expectoration tinged with blood. But by continuing the regimen prescribed, and by relaxing the passages, the girl one morning upon rising, being attacked with her usual cough in a form rather violent, was sensible of some object ascending to the larynx, and announced to her mother that the tooth would immediately be ejected. She was not deceived; for a little after she expelled the tooth by coughing; and was thus delivered from all cough and wheezing.

" It is important, however, to know, that, upon inspecting and examining the *fauces*, no foreign body, or any sort of pain, was ever detected in that region. This was tried and ascertained by several professional persons, both physicians and surgeons, of no moderate estimation.

" The cough was never absent; difficult breathing often came on; and, what is particularly deserving of notice is, that during the day, indeed, the wheezing and *rhonchus* during respiration, after the first days of the accident, not unfrequently subsided, probably by reason of the tooth falling farther down, while the patient was in the erect position; but that both symptoms returned with the most invariable regularity as soon as the patient went to bed and assumed the horizontal position, the tooth being then carried farther up, as it appeared. The fortunate day on which the tooth was coughed up did not take place till about six or seven weeks after the extraction of the tooth. This was the mode in which nature, providentially aided by the physician, extricated herself from a danger so urgent." *

As several professional friends who had seen the ear of grass were of opinion, that, from its singularity, a delineation of the object might be interesting, I think this is a proper opportunity for giving delineated figures of the foreign bodies in all the recorded cases in which figures have been preserved. They are therefore represented in chronological order in Plate III.

Figure 1st is the button foil mentioned in the case of Alexander Sinclair, which occurred in the practice of Dr Lettsom.

Figure 2d is a view of the nail which dropped into the windpipe of James Butler, the case recorded by Mr Howship.

Figure 3d is a view of the form of the artificial tooth which remained two years and seven months in the bronchial tubes of the lady who was patient to Dr Maclagan and Dr Abercrombie.

Figure 4th is the fragment of walnut coughed up by H. S. the boy who was under the care of Dr John Scott.

Figure 5th is a view of the two fragments of the molar tooth of John Clare, the lower one of which was found after death in the right bronchial tube.

And Figure 6th is a view of the ear of grass which remained for about seven weeks in the bronchial tubes of the young lady who was under the care of Dr Donaldson.

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* Institut. Medicin. Pract. Vol. iii. cap. xvii. Leipsiæ, 1786.

Fig. 1.
Button-foil.
p. 103.

Fig. 2.
Iron Nail.
p. 104.

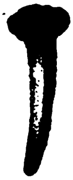


Fig. 3.
Artificial Tooth.
p. 105.

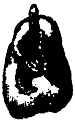


Fig. 4.
Fragment of Walnut.
p. 106.

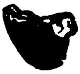


Fig. 5.
Fragments of Molar Tooth.
p. 108.

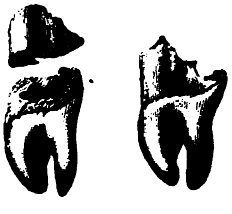
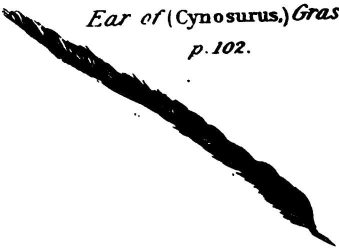


Fig. 6.
Ear of (Cynosurus,) *Grass.*
p. 102.



PART II.

CRITICAL ANALYSIS.

Art. I.—1. *Caroli Francisci Bellingeri E. S. Agatha Derthonensi, Phil. et Med. Doct. Amplissimi Med. Collegii Candidati Dissert. Inauguralis quam Publice defendebat, in Athenæo Regio Anno* MDCCCXVIII. *die ix. Maii hora ix. matutina.* Augustæ Taurinorum, Excud. Joseph Favale. 8vo. Pp. 337. *Ex Anatome; De Nervis Faciei. Ex Physiologia; Quinti et Septimi Paris Functiones. Ex Medicina Theorica; De Neuralgia Faciei. Ex Praxi, Cura Neuralgiæ Faciei. Ex Materia Medica; Specimen de Remediis Nervinis.*

2. *C. F. Bellingeri De Medulla Spinali.* Aug. Turinor, 4to, 1823.
3. *Experimenta in Nervorum Antagonismum, habita a Carolo Francisco Bellingeri. Lecta die 22 Februarii* 1824.
4. *Experimenta Physiologica in Medullam Spinalem, habita a Carolo Francisco Bellingeri. Lecta die* 13 *Junii* 1824. *From the Memorie Della Reale Accademia Delle Scienze Di Torino,* Tome xxx. Torino, 1826, p. 35.
5. *Ragionamenti, Sperienze ed Osservazioni Patologiche comprovanti l'Antagonismo Nervoso, esposti e Raccolte da Carlo Francisco Bellingeri Medico Della Real Corte Pel Solo Titolo, Preside della Facolta Medica Nella R. Universita, &c.* Torino, 1833, 8vo. pp. 397.

In resuming our examination of the writings and doctrines of Bellingeri, we must be guided chiefly by the chronological order, and partly by affinity of subject; and therefore, for the same reason that we began with his Dissertation on the Fifth and Seventh Pair of Nerves, we shall now return to the subject, by considering his work on the anatomical structure and the functions of the spinal chord. Were we to continue the examination of the first dissertation, it would lead us into the subject of Neuralgia and its remedies; and thus rather abruptly break the train of physiological inquiry. To the second, third, and fourth articles in our list, therefore, which contain his investigations on the Structure and Functions of the Spinal Chord, methodical arrangement now requires that we direct our attention.

The structure of the spinal chord, or that portion of the central mass of the nervous system contained within the vertebral column, has been studied with various degrees of attention and success by De Blaes, Huber, Morgagni, Haller, Frotscher, Arnemann, Mayer, Keuffel, Sabatier, Chaussier, Gall, and Racchetti; and the researches of these anatomists have assuredly contributed to increase materially the stock of knowledge on the structure of this important part of the nervous system. These researches, nevertheless, did not supersede future inquiry. Many points still required more precise information; and even the new views taken on the functions of the different classes of nerves issuing from the chord, or otherwise connected with it, were substantial reasons for renewed investigation.

In the present dissertation the author proposes the following points for the subject of inquiry: *first*, to demonstrate the true arrangement of the cineritious or gray-coloured matter in the centre of the spinal chord; *secondly*, to demonstrate the presence of the posterior collateral *sulci* or furrows, and the anterior collateral fissures; *thirdly*, to show the division of the spinal chord into six *fasciculi* or strands; *fourthly*, to trace the peculiar origin of the anterior and posterior roots of the spinal nerves, and also the origin of the accessory nerve of the *nervus vagus* or pneumogastric nerve; and lastly, to apply the facts thus established, along with those obtained from pathological phenomena, in illustrating the physiological doctrines regarding the functions of the spinal chord.

I. By immersing the spinal chord of the human subject and various animals in strong nitrous acid, and making a series of transverse sections, M. Bellingeri finds that the gray matter of the spinal chord is arranged in such a manner as to present, by its sections, the appearance of two circular or curvilinear segments, with their convexities mutually directed to each other, in this manner,)–(. In the human subject these segments are less incurvated than in the lower animals, or, in other words, they form segments of a larger circle, and they approach so near each other as almost to touch, thus)(. The extremities of these segments Bellingeri distinguishes by the name of anterior and posterior peaks (*cornua*) of the gray matter. The former are thick and rather elongated, but distant a millimetre, or the $\frac{1}{25}$ part of an English inch from the circumference of the chord. The posterior *cornua* are much thinner, less divergent, and about half a millimetre, or the 50th part of an English inch, from the circumference of the chord.

The anterior median furrow or longitudinal depression does not penetrate to this gray matter, but is placed at the distance of about a millimetre, or the $\frac{1}{25}$ part of an English inch, by a stratum of white matter of the thickness now specified. The posterior median furrow, on the contrary, which penetrates to the contact of the gray matter, in opposition to the assertion of

Gall, who represents it as scarcely touching the substance of the gray matter,—is a little deeper than the anterior,—an arrangement which also accords with the fact, that the gray or cineritious matter is placed nearer to the anterior than the posterior surface of the chord.

On each side of the posterior median furrow are further seen the posterior collateral furrows, which, though extending longitudinally from the cranial to the sacral extremity of the chord, are, nevertheless, not parallel, but are more apart or divergent at the cranial end of the chord than below.

From the arrangement now noticed of the cineritious or gray matter, and from the presence of the furrows specified, it results, that the chord is divided into six whitish or medullary columns or strands, the two anterior of which are mutually separated through their greatest extent by the anterior median furrow, but communicating at its bottom by whitish matter; while the anterior strands are also divided for their greatest extent from the lateral by the anterior *cornua* of cineritious matter; yet in this region the anterior and lateral strands mutually communicate, since the anterior *cornua* do not advance quite to the periphery of the chord. Lastly, the two posterior columns or strands are completely parted from each other by the posterior median furrow, and altogether separated also from the lateral strands by the posterior *cornua* of the gray matter, and by the posterior collateral furrows. By comparing the mutual thickness of these strands, it is evident that in this, as in almost all the other regions of the spinal chord, the lateral strands are thickest, then the posterior, and that the anterior are the thinnest of the whole.

In this manner, that is, by considering the arrangement of the gray matter, and the presence of the specified furrows, Bellingeri thinks it is demonstrated that the spinal chord is divided into six whitish or medullary bundles or strands. By considering, further, the communication of these six strands with the brain, he conceives that they may in this sense be distinguished by a different name, that is, that the anterior strands, which are continuous with the *corpora pyramidalia*, and therefore communicate almost directly with the brain, may be denominated *cerebral* strands; the lateral ones, which are continuous with the *corpora restiformia*, may be denominated restiform strands; and the posterior columns, which are continuous with the *cerebellum*, may be designated cerebellic columns or strands.

The disposition of the gray or cineritious matter further varies a little in different regions of the chord. Thus, by a section of the spinal chord near the cerebral extremity between the first and second cervical pairs of nerves, the semicircles of the gray matter appear a little apart from each other, so as to assume the following figure)—(; the anterior *cornua* being thicker than the posterior, less divergent, and about $\frac{1}{25}$th of an English inch distant from the peripheral aspect of the chord. It may be also observed, that in this section the lateral columns or strands of the chord are very thick, next the posterior strands, and the anterior the smallest and thinnest.

A transverse section of the chord between the fourth and fifth cervical pairs displays the gray coloured matter in a much closer position to the anterior peaks, and shows, that it is here most abundant, as is seen by the thickness of these peaks. A transverse section still lower down, viz. between the last cervical and first dorsal pair, exhibits almost the same shape of the gray matter, though less in quantity, and not only the anterior and posterior median furrows, but the posterior collateral furrows, and the anterior collateral fissures,—showing the division of the chord into six separate strands.

Bellingeri further observes, that in this region, namely, the cervical of the chord, there are occasionally observed on the posterior surface other two furrows, viz. one on each side of the posterior median furrow, and little distant from it, and to which he applies the name of *posterior intermediate sulci.* These furrows were delineated, he admits, by Gall, who, however, represents them as not penetrating to the contact of the gray matter, while Bellingeri asserts that he has seen them of this depth; and not only in the cervical, but in the dorsal region, as far down as the tenth pair of dorsal nerves. Though these furrows are not quite constant, yet, as they are occasionally observed, and as it is evident that, when they are present, they subdivide the posterior strands of the spinal chord into two smaller strands,—it results, that, in such circumstances, the spinal chord must consist of eight component strands, of which these situate between the posterior median furrow, and the posterior intermediate furrows, are the smallest.

A transverse section of the chord between the sixth and seventh pairs of dorsal nerves, shows the gray-coloured matter situate much nearer the anterior surface than in the superior regions of the chord; its semicircles rather more remote from each other; the anterior peaks short, thick, and ending in semicircles, and distant about the one-seventeenth of an English inch from the periphery of the chord; the posterior peaks small, little divergent, and about one-eleventh of an English inch distant from the periphery.

It is unnecessary to reproduce the detailed account of the appearances of the sections made by Bellingeri between the last dorsal and first lumbar pairs, between the third and fourth lumbar pairs, between the last lumbar and first sacral pairs, and between the fourth and fifth sacral pairs. It is sufficient to state, that, in the latter region, the quantity of white or medullary matter so much diminishes, that the gray matter equals and occasionally exceeds it; that the latter occupies in this position the centre of the chord, but a little inclined towards the anterior surface—*i. e.* about one-fiftieth of an inch more; that its figure has undergone so great a change as to become quadrilateral, or make an approach to the shape of a St Andrew's cross; and, lastly, that the division of the chord into six lines or strands is still distinctly perceptible.

Upon the whole, the following circumstances may be regarded as constant characters of the spinal chord in the human subject, deduced from a considerable number and variety of cases.

1. The quantity of whitish or medullary matter in the spinal chord far exceeds the quantity of gray or cineritious matter from the cerebral extremity to the sacral region of the chord; but in the latter situation, the quantity of both is nearly equal, or that of the gray matter is rather in excess. 2. This substance, namely, the gray matter, is most abundant in the cervical region, the middle lumbar, and the whole of the sacral region. 3. The shape of the gray matter is like the cypher)(in the cerebral or cephalic region of the chord, resembles two circular segments united by a cross line, thus)–(, in the whole course of the chord, and at the sacral extremity assumes the quadrilateral shape. 4. The gray matter in the tract of the junction of its semicircles is situate more or less near the anterior surface of the chord from its cerebral end to the middle of the lumbar region; but here, and in the sacral region, it either occupies the central axis of the chord, or inclines a little more to its posterior surface. 5. The anterior peaks of the transverse sections of the gray matter are everywhere thicker than the posterior, and at no part reach the surface of the chord. 6. It is an invariable character, that the anterior median depression is nowhere so deep as to be in contact with the gray or cineritious matter, and conversely, that the posterior median furrow always penetrates to this gray substance.

Few varieties in the disposition of the gray matter, except those already specified, are observed; and these refer chiefly to the different degrees of thickness and of the prominence of the peaks, especially the posterior ones; for occasionally these peaks advance to the surface of the chord,—especially in the cervical, lumbar, and sacral regions,—a circumstance, be it remarked, connected with the absence of the posterior collateral furrows.

It may further be regarded as established, that the spinal chord consists, through its entire course, of *six* whitish or medullary strands; viz. two anterior, two lateral, and two posterior. The two anterior strands, which are separated from each other for the most part by a line corresponding to the anterior median furrow, yet, at the bottom of this furrow, are in mutual communication by a layer, more or less considerable, of whitish cerebral matter, and parted from the lateral strands by the anterior peaks of the gray matter, yet communicating with them towards the surface of the chord by a layer of whitish matter,—and elsewhere completely separated from each other by the anterior peaks already specified, and by the anterior collateral fissures. The lateral and posterior strands are always completely separated from each other, either by the posterior peaks alone of the gray matter of the chord, when they reach its surface, or by the said peaks, or by the posterior collateral furrows. Lastly, the posterior strands of the chord are completely parted from each other through their whole course by means of the posterior median furrow.

With regard to the subdivision of the posterior strands by means of the posterior intermediate *sulci*, causing the division of the chord into eight component strands, it is ascertained that this division is not uniform in all individuals, and is occasionally seen only in the superior cervical region, very rarely in the dorsal region, and never in the lumbar and sacral regions; and for this reason, Bellingeri is of opinion, that this division is accidental, and that the spinal chord must be regarded as consisting only of six constituent columns or strands.

As to the comparative thickness of these component strands of the spinal chord, it is ascertained that the lateral ones are thicker than the others, from the bulb or cerebral extremity of the chord as far as the sacral region, but that in the latter region, they are either of the same thickness or a little thinner;—that the anterior strands are every where thinner than the others, excepting in the upper sacral region, where they are a little thicker than the others;—and that lastly, the posterior strands are invariably more slender than the lateral, but thicker than the anterior, excepting in the sacral region.

Lastly, upon comparing the various degrees of thickness of all the strands in the specified transverse sections of the spinal chord, it results, that all the strands constituting the chord become alternately thick and thin, according as the chord itself becomes thick or slender in the different regions; but, upon attentive examination, it is evident that the variable degrees of thickness in the different regions of the chord are principally effected by variations in the diameter of its lateral strands.

We have next to advert to the views which the author deduces from comparing the structure of the spinal chord of the human body with that of several of the lower animals. The principal circumstances resulting from this comparison, deserving notice, are the following.

It appears that though the general configuration of the gray matter of the chord, as evinced by transverse sections, bears, on the whole, a close resemblance to that of the human subject, yet the position of the gray matter undergoes some change in the inferior lumbar and superior sacral regions in the animals examined; while in man the gray matter occupies the centre of the chord, or inclines a very little to the posterior surface,—in the ox and goat it holds the centre, or inclines towards the anterior surface, and in birds it is much nearer the anterior surface.

The posterior median furrow also, which in man is every where deeper than the anterior median furrow, is less deep than it is in the ox, goat, and in birds in general,—excepting, however, almost the whole cervical region in the ox, and the inferior lumbar and superior sacral regions in the ox, goat, and in birds, in which the greater depth of the posterior median furrow predominates, as in man, over that of the anterior.

In these animals also, while the same division of the chord into six constituent strands is recognized, it appears that, conversely to what is observed in the human body, the anterior strands are a little thicker in general than the posterior, excepting the superior cervical region in the ox, and the inferior lumbar and sacral regions in the ox, goat, and in birds, in which the excess of thickness is on the side of the posterior strands.

When the chord is divested of its celluloso-vascular covering, denominated the *pia mater*, the anterior surface then presents the anterior median furrow extending its whole length, and on the sides the fissures more or less lengthened, more or less remote from each other, and generally extending in a longitudinal straight line, and in some parts penetrating deep into the substance of the chord. These fissures *(scissuræ)* into which penetrate small processes of the *pia mater*, blood-vessels, and some primary filaments of the spinal nerves, M. Bellingeri distinguishes particularly from the *sulci*, in this respect, that they are not continuously extended along the whole length of the chord, but are at intervals interrupted by a course or layer of whitish matter. The latter circumstance, he observes, explains the reason why these fissures are not visible in all the transverse sections of the spinal chord; for if the chord be divided in those parts in which the whitish matter is continuous, then no fissures will appear in the transverse sections, or on one side a fissure may be visible, and on another none.

Though it be thus difficult to demonstrate the presence of these fissures, and though Gall asserted that they were not constant or real, but were the result of dissection, or the detachment of the roots of the spinal nerves, Bellingeri maintains that they are essential anatomical characters of the chord, because they are manifest in its transverse sections previous to the detachment of the *pia mater* and roots of the nerves. By the presence of these fissures, therefore, on the anterior surface of the chord, Bellingeri further contends that the anterior strands, though not completely, are, for the greatest part, separated from the lateral strands by these means, and that they communicate by minute layers of whitish cerebral matter.

Besides these longitudinal fissures, the anterior surface of the chord divested of its *pia mater* presents numerous minute points and irregular fissures, the former of which indicate the entrance of blood-vessels, or emergence of nervous filaments; the latter, the attachment of processes of the *pia mater*, which penetrate more or less deeply into the substance of the chord.

The posterior surface of the chord, when denuded of its membranous investment, is not less important. Besides the posterior median furrow, the observer recognizes on each side, at the distance of two millimetres, or about one twelfth of an English inch, a series of minute points disposed in a longitudinal straight line, and continued almost the whole length of the chord, being wanting only in the sacral region. These indicate the entrance of blood-vessels and processes of the *pia mater*.

On each side of the posterior median furrow, at the distance of about three lines, are observed the posterior collateral furrows, which proceed almost in a straight line the whole length of the spinal chord,—penetrating to the contact of the posterior peaks of the gray matter, as already mentioned, and dividing perfectly the posterior from the lateral strands of the chord.

The surface of these posterior strands presents, at the inner margin of the collateral furrows, a series of minute points or apertures and canals, which correspond to the entrance or exit of blood-vessels and nervous filaments.

On the outside of the posterior collateral furrows, at the distance of one or two lines in some parts, and especially in the cervical and lumbar regions, are seen fissures extending not above two or three lines; and sometimes longitudinal furrows, extending an inch or more, are observed; yet these furrows and fissures are not constant.

Finally, Bellingeri justly remarks, when treating of this subject, that the *pia mater* not only covers the spinal chord, but enters deeply into its substance, and, supporting its nutrient vessels, may be regarded as the nutrient tissue of that portion of the nervous system. Upon its detachment, also, it ought to be observed, that the fibrous structure of the white matter is distinctly seen on the surface of the several strands of the chord, and, indeed, these fibres appear to be interwoven and commingled variously with each other.

The next subject brought under investigation is the point at which the spinal nerves originate from the chord; and in ascertaining this, the author has recourse to transverse sections of the chord, previously divested of the *pia mater*, and indurated by immersion in nitric acid diluted with a large proportion of water.

By pursuing this mode of investigation, Bellingeri shows that the filaments of the posterior roots of the spinal nerves have, in the human subject at least, three different origins;—viz. 1. from the posterior collateral furrows; 2. from the posterior peaks of the gray matter; and 3. from the posterior strands of the chord. Thus he shows, *first*, that whatever region of the chord be inspected, though all the filaments of the posterior roots of the spinal nerves appear to issue directly from the posterior collateral furrows, and before the posterior peaks of the gray matter, or, as occasionally happens, from the posterior peaks themselves, —and, in point of fact, the majority do issue from these points, —yet several fibres may be distinctly traced to the posterior strands of the chord. Bellingeri states that, in the human body, he has rarely observed in the posterior roots fibres issuing, separately from the others, from the lateral strands of the chord, though this often takes place distinctly in the spinal chord of the ox; but that, if it be remembered that the filaments of the posterior roots are very thick, and the posterior collateral furrow very slender, it must be obviously impossible for all the filaments of the posterior roots to spring from this furrow alone, but that part of these filaments must belong to the lateral strands of the chord. The majority, however, of the fibres of the posterior roots issue directly from the posterior peaks of the gray matter; and when these fibres appear to proceed from the posterior collateral furrows, they do not originate in them, but merely penetrate so as to be in contact and continuity with the posterior peaks. There are, however, other fibres of the posterior roots, which are manifestly seen to spring directly from the whitish or medullary matter of the posterior strands of the spinal chord; and these constitute the third origin.

It appears to us, that in this matter there is less difficulty than the ingenious author imagines. As the posterior strands are separated from the lateral by the posterior collateral furrows, and as the longitudinal ridge of gray matter which forms in transverse sections of the chord the posterior peaks, approaches necessarily very near these collateral furrows, it must result that all these points of the spinal chord must very nearly coincide, if not communicate, on each side respectively; and hence the posterior roots of the spinal nerves, which are here found to issue from the chord, may seem, and may be justly said, to issue from all the three.

He then shows that all the filaments and roots of the accessory nerves arise a little further to the sides of the chord, and, indeed, two or three millimetres, or, in other words, rather more than a line distant from the posterior collateral furrow and the posterior roots,—so that, he remarks, all the filaments of this nerve proceed exclusively from the lateral strands of the chord, and, consequently, solely from whitish or medullary matter.

The anterior roots of the spinal nerves, he represents to consist of several fibres, arranged in threefold order, viz. anterior, middle, and posterior, or at least lateral. The origin of these fibres varies a little in the different regions of the chord. Thus, in the cephalic or superior end of the chord, the anterior or internal fibres of the anterior root of the first cervical pair spring immediately before the *internal* extremity of the anterior peaks of the gray matter; the middle fibres of this root spring before the semicircle of these peaks; and the posterior or lateral fibres issue from the chord before the *external* extremity of the anterior peaks of the gray matter;—so that all the right and left fibres of the anterior root of the first pair emerge from the spinal chord anterior to the said peaks of the gray matter, yet in such a manner that the more anterior fibres appear to belong to the anterior strands, while the posterior fibres seem to belong to the lateral strands. All these fibres, therefore, are derived from white matter; but as some seem to plunge deep into the chord by the canal of the *pia mater*, Bellingeri asks, whether there be not reason to think that some of them, at least, may be in contact with, if not derived from, the gray matter.

In the region of the second cervical pair, the anterior fibres in the anterior root of this pair arise immediately before the extremity of the anterior peaks, while all the other fibres spring from the lateral strands of the chord. In the region of the fifth cervical, again, the anterior fibres of the anterior root of that pair rise immediately before the anterior collateral furrows, yet in such a manner that they seem to pertain also to the anterior strands of the chord, while all the other fibres spring, indeed, from the lateral strands, but anterior to the extremity of the anterior peaks of the gray matter. All the fibres of the anterior roots of the first dorsal pair issue from the lateral strands, anterior to the anterior peaks of the gray matter; but the fibres which in this root belong to the class of anterior, incline a little to, and emerge before, the anterior collateral fissures. *Lastly*, all the fibres of the anterior roots of the seventh dorsal pair emerge from the lateral strands of the chord, immediately before the anterior peaks of the gray matter.

As our examination proceeds further down the chord, this variety of origin rather augments. Thus the fibres of the anterior roots of the first pair of lumbar nerves rise in such a manner, that the most anterior spring from the anterior strands of the chord, and the others from the lateral strands, but before the anterior peaks of the gray matter. The fibres of the anterior roots of the fourth pair of lumbar nerves emerge from the chord in three rows, viz. the anterior fibres from the anterior strands; the middle fibres from the line immediately before the anterior collateral fissures; and the posterior or lateral fibres from the lateral strands before the anterior peaks of the gray matter. The anterior root of the first pair of sacral nerves presents anterior fibres issuing from the anterior strands, and middle and posterior fibres springing from the lateral strands before the anterior peaks of the gray matter. *Lastly*, while in the anterior root of the fourth sacral nerves the anterior fibres spring from the anterior strands of the chord, the middle fibres rise before the anterior peaks, while the posterior fibres spring from the lateral strands of the chord.

From these facts, the author infers that all the anterior roots of the spinal nerves consist of several fibres, arranged not, indeed, in one uniform order, but rising in different points of the spinal chord; that in the human body, the origin is threefold in the cervical, lumbar, and sacral regions; and that it seems single in the dorsal, that is to say, from the lateral strands only. He subsequently, however, proceeds to show that there is reason to believe that in the dorsal region the origins are also threefold.

We pass over various details very important, indeed, but which our space will not allow us to introduce, on the origins of the spinal nerves in several of the lower animals; and we proceed to advert to the author's account of the mode in which the filaments of the accessory branch of the pneumogastric nerve originate.

It is well known that, though this nerve is admitted to arise from the spinal chord, it is by no means agreed among anatomists at what exact points of the spinal chord its initial filaments arise. Thus Huber represents its lowest or initial extremity to proceed from the chord near the posterior filaments of the seventh cervical pair. * Lobstein, again, who traced the literary history of this nerve with indefatigable study and great accuracy, and examined its origin with perfect knowledge of the researches of his predecessors, states that he saw its most slender primordial filament issuing from the chord close by the sixth pair of cervical nerves.[*] Soemmering describes its origin to be generally from the posterior root of the fourth, fifth, sixth, or even the seventh cervical pairs[†]; and Frotscher, who examined carefully the whole spinal chord, has traced its initial filaments as low down, he assures us, as the posterior filament of the third pair of dorsal nerves[‡]. Bichat contents himself with saying, that its origin is extremely variable, and that it is usually opposite the fourth, sometimes opposite the sixth, or even the seventh cervical nerves, and very rarely opposite the second or first cervical vertebral that it becomes visible[§]; and Meckel[||] more wisely represents its lowest root to rise generally at the level of the superior filament of the posterior roots of the seventh cervical pair; the second at the level of the upper part of the posterior root of the fifth cervical pair; the third and fourth at the level of the upper part of the fourth cervical pair; and so forth,—all communicating with each other more or less frequently by anastomotic filaments. Bellingeri justly remarks, that this discordance of statement among different anatomists shows that the exact point of origin is not invariable, and that it may rise a little below or a little above any of the points specified. The most common origin, founded on the united observations of Huber and Scarpa, is perhaps that which represents the first or initial rise of the accessory nerve to emerge from the spinal chord, about the level of the posterior root of the sixth pair of cervical nerves.

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* Programma de Medulla Spinali. Goettingæ, 1741. Necnon Comment. de Med. Spinali. Goetting.

Aware of this discordance, Bellingeri was desirous to determine if the origin of the nerve, so variable in the longitudinal direction of the chord, observed any regularity in the transverse direction, and to ascertain whether its initial filaments were derived from the posterior roots, or from a space behind these roots. From minute and careful examination of several specimens of the chord both in the human body and the ox, he infers that all the filaments of the accessory nerve invariably issue from the lateral strands of the spinal chord; that in the ox there is no communication by means of nervous filaments between the accessory nerve and the posterior roots of the spinal nerves, but that in the human body a communication occasionally takes place between the accessory nerve and the posterior roots of the first, more rarely of the second pair of cervical nerves. In the latter case, however, he remarks, the accessory nerve furnishing the supplementary filament, or that which proceeds to the posterior root of the first pair, generally presents a minute ganglion, and the filaments of the accessory nerve forming the said posterior root partly or entirely, are not entirely proper to the accessory nerve, but are the same filaments of the posterior roots, which merely approach to the trunk of the accessory nerve.

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[*] De Nervo Spinali ad Par Vagum Access. Argentorati, 1760. Apud Ludwig, Tom. ii. et Sandifort, Tom. i.

[†] De Fabrica Corporis Humani, Tom. iv. § cclxv.

[‡] De Medulla Spinali ejusque Nervis, Erlangæ, 1788. Apud Ludwig, Tom. iv.

[§] Traité d'Anatomie Descriptive, Tom. iii.

[||] Handbuch der Menschlichen Anatomie, Band. iii.

From these several facts regarding the constitution of the spinal chord and the mode in which the nerves originate, M. Bellingeri proceeds, in the second section of his memoir, to establish certain general conclusions, partly anatomical, partly physiological and pathological. These may be stated in the following order.

1. The spinal chord consists of two sorts of nervous or cerebral matter, one cineritious, ash-coloured, or gray-coloured, placed on the centre like a longitudinal axis, the other whitish, forming the exterior covering or surface of the chord. The structure of the white matter is fibrous, while that of the gray is globular, or aggregated, granular, and homogeneous. The quantity of the white matter is much greater than than that of the gray, unless in the sacral region, where the proportion of both is nearly equal, or that of the gray rather in excess. The gray matter is arranged on each side of the mesial plane in the shape of a long scoop, with the convex side turned towards the mesial plane, and the concave towards the lateral surfaces of the chord, —each longitudinal scoop being united to its fellow by a long slip of gray matter cutting the mesial plane of the chord at right angles. The anterior margins of these scoops, which form in the transverse sections the anterior peaks or horns of the gray matter, at no point approach the surface of the chord.

The result of this arrangement is, that the white matter of the spinal chord is placed like imperfect or oblate cylinders on the concave surfaces of the long gray-coloured scoops, and partly on the convex surfaces, and on the anterior and posterior surfaces of the long gray-coloured middle band. From both species of nervous matter, namely, the white and the gray, the nervous filaments take their origin.

2. Of the two median furrows the anterior is the largest, but does not penetrate to the gray matter; the posterior the smallest, yet advancing to contact with the gray-coloured matter,—indicating that the gray-coloured axis makes a closer approach to the posterior than the anterior surface of the chord.

3. Of the six columnar masses or strands which enter into the composition of the spinal chord, the anterior are parted from each other not entirely, but for the greater part of their extent,

and from the lateral ones alternately, completely, and imperfectly; while the posterior ones are completely separated from each other, and from the lateral. The lateral strands are the thickest, occupying chiefly the concave surfaces of the long scoops of gray matter. All of these columnar masses give origin to the nervous filaments. The anterior strands, which are in continuity with the pyramidal bodies and the *crura* of the brain, and thence communicate with the brain, may be designated Cerebral Strands of the Chord. The lateral columns, which are continuous with the *corpora restiformia*, may be denominated Restiform Strands. And the posterior columns, which communicate directly with the *cerebellum*, may be called Cerebellic Strands.

4. Of the three roots of the anterior spinal nerves, some filaments issue from the white matter of the anterior and lateral strands, some from the anterior peaks of the gray matter, and some from the surface or substance of the white medullary matter. The anterior roots in the human body have no connection with the spinal *ganglia*.

5. Of the threefold rows of filaments forming the anterior spinal nerves, the greatest part issue immediately from the posterior peaks of the gray-coloured matter; and a small proportion only issue from the white matter of the posterior strands. These posterior roots only enter the spinal *ganglia*.

6. Upon comparing the anterior and posterior roots of the spinal nerves, it results that the chief differences are the following:—1*st*, the filaments of the posterior roots are thicker in calibre, but fewer in number, than those of the anterior roots; 2*d*, the filaments of the posterior roots only evince a plexiform structure; 3*d*, the posterior roots only form ganglions; 4*th*, the contiguous posterior roots almost all communicate by means of nervous filaments.

II. In considering the particular uses of the different orders of spinal nerves, M. Bellingeri begins by showing that the lateral strands of the spinal chord preside over the organic functions and instinctive acts. In proof of this doctrine he observes, in the *first* place, that the ganglioform arrangement belongs only to the lateral strands, which alone, he observes, evince in their construction this species of enlargement, while the anterior and posterior strands are almost uniformly flattened; *secondly*, that they are continuous with the *corpora restiformia*, from which only arise other nerves connected with the organic or involuntary actions,—for example, the pneumogastric and the glossopharyngeal nerves; and *thirdly*, because the accessory nerve, which is unquestionably one destined to influence the organic actions, is derived from these lateral strands of the spinal chord.

By a converse mode of reasoning, he infers that the anterior strands which communicate with the brain, and the posterior strands, which communicate with the *cerebellum*, are both devoted to the animal functions only.

The inquiry into the exact functions of the anterior roots of the spinal nerves leads the author into some curious anatomico-physiological disquisition. These roots, he had already shown, are derived partly from the anterior or cerebral strands of the chord, and partly from the lateral or restiform strands of the chord. The former he represents to preside over the voluntary motions, because it is a well known and generally admitted physiological principle, that the brain and the cerebral nerves are devoted to the actions of voluntary motion, or to those connected with animal life. The latter, however, namely, the filaments derived from the lateral or restiform strands, he conceives, regulate all the organic, involuntary, and instinctive motions, because, he argues, the lateral strands generally, and the restiform bodies with which they are connected, give origin only to nerves which regulate actions of this class. Thus the accessory spinal nerve, which issues solely from the lateral strands, in conjunction with the pneumogastric, sends its branches to organs of involuntary motion only; and the pneumogastric nerve itself, which is principally derived from the restiform bodies, is also distributed entirely to the organs of involuntary motion. To this he adds, that the filaments which contribute to form the intercostal nerve are derived, according to his observation, from the lateral or restiform strands of the spinal chord, and consequently, he infers that this circumstance ought to be conjoined with the other arguments of the same tendency. On this point, however, he admits that we still require the observation of accurate and skilful anatomists.

He further remarks upon this point, that not the whole of the restiform filaments of the anterior roots, *i. e.* the filaments of the anterior roots derived from the lateral strands, are expended in the intercostal nerve, and that several of them are conjoined with the ordinary spinal nerves, in order to regulate the organic or involuntary functions of the parts to which they are distributed, in other words, to regulate the circulation, absorption, nutrition, secretions, and animal temperature of the muscles and parts of the trunk and extremities. And he adds, by way of illustration;—" For the spinal marrow presides, by appropriate nerves, over these functions in the whole body and in the extremities, as is demonstrated by its more serious diseases; for there is a class of palsies in which sensation and voluntary motion are deficient, while the other organic functions remain unimpaired in the paralytic part; and there is another class in which circulation, nutrition, absorption, the secretions, and the temperature, are greatly deranged from their healthy condition. The same phenomena may also be observed in the vertebral disease of Pott. We must, therefore, believe that there are even in the extremities nerves, or rather nervous filaments, devoted exclusively to animal sensation and voluntary motion, and other filaments contributing only to the performance of the organic functions, as is manifest in the other organs of sensation, viz. the eye, the ear, the nostrils, and the mouth. Now, the last class of nervous filaments which also enter into the composition of the spinal nerves, according to my views on this subject, spring from the lateral strands of the spinal marrow; and upon this point I observe, that the external branch of the accessory nerve, which derives its origin from the same lateral strands, excites only involuntary motions in the muscles of the cervical region, as will appear from what is now to be stated."

In explaining his doctrines regarding the functions of the posterior roots of the spinal nerves, M. Bellingeri employs a similar mode of reasoning and induction. These roots, it will be remembered, like the former, derive their primordial filaments from three different parts of the chord, viz. the posterior or cerebellic strands, the lateral or restiform strands, and the posterior peaks of the gray matter; and he consequently assigns to each set properties corresponding to the respective source of issue. The first set he regards as devoted to voluntary motions, because the *cerebellum*, according to his doctrines, is not only an organ presiding over and regulating motion, but regulates voluntary motion only. The second order of filaments, or those issuing from the lateral strands, he regards as devoted to the same purposes in the case of the posterior, as in that of the anterior roots, namely, organic functions and involuntary motions.

The difficulty then comes to be, how to explain the functions of those filaments which issue from the posterior ridges or peaks of the gray matter; and these, he ingeniously conjectures, are intended to preside over the sensation of animal sensibility and *tact*. The reasons for this opinion are the following. In the posterior roots only do we recognize the plexuous structure in their course and origin; in these only do we find the spinal ganglions; the filaments of these roots are thicker than those of the anterior; and lastly, several filaments of these roots communicate directly with the gray or cineritious matter. All these characters again, he argues, belong to nerves, not of motion but of sensation. Thus the olfactory nerve, the optic and the auditory nerve, evidently arise from gray-coloured matter, or, at least, in their origin communicate with such matter; and, indeed, the olfactory nerve is mostly composed of this gray-coloured matter; these nerves manifestly evince a plexuous or ganglioform structure; and all of them are bulkier than mere nerves of motion.

Thus, the large portion of the Fifth Pair, he argues, which ministers to the sense of taste and animal tact, has a plexuous structure, as is proved by its semilunar plexus, commonly called the Gasserian Ganglion, and forms not only simple ganglions, as the spheno-palatine and maxillary, but compound, as the ophthalmic, and is remarkable for its thickness and bulk. From all these considerations he infers, that the plexuous and ganglioform arrangement, a greater degree of thickness, and origin from gray-coloured matter, are characters of nerves contributing to the function of animal sensibility. On the contrary, he observes, that the nerves of voluntary motion arise from whitish nervous matter, show neither the plexuous nor the ganglioform structure in their trunks, and are smaller than the sentient nerves; and all these characters, he observes, belong to the third, fourth, and sixth pairs of cerebral nerves, the facial nerve, and the hypoglossal. From all these combined facts and arguments, M. Bellingeri concludes, that the posterior roots only, and not the anterior roots, are devoted to the faculty of animal tact, and further, that not even all the filaments of these posterior roots, but only those which issue directly from, or communicate with, the posterior *cornua*, or peaks, which form the long margins of the gray matter of the chord, are subservient to sensation.

On these reasonings, and these conclusions, it is perhaps unnecessary to offer any comment. We confess we think them highly ingenious, and, upon the whole, more remarkable for method and consistency, both with each other and with other admitted principles of physiology, than most other doctrines taught on the same subject. He mentions, what is pretty manifest from collateral evidence, that all these views he had established and proved before he met with the experiments of Magendie,—the results of which, upon the whole, accorded with the general accuracy of the conclusions at which he had by reasoning arrived. He differs, however, from Magendie in this circumstance, that he allows the posterior roots to possess some influence over the motions of the living body.

It is proper in this part to mention, that the Memoir of Bellingeri was first partly read to the Royal Academy of Sciences at Turin on the 6th of January 1822, and from time to time till the last or concluding reading, which took place on the 26th January 1823. Bellingeri, in the course of printing his memoir, became acquainted with the experiments of Sir Charles Bell through the Fourth Number of the *Journal de Physiologie Experimentale* of M. Magendie, in which they were published about the close of 1821, and through the Fifth Number of the same Journal, published in the beginning of 1822; and subsequently with the experiments of Magendie himself, which were first published in the Seventh and Eighth Numbers of the same Journal about the close of 1822. It is evident, therefore, that, whatever confirmation of his views, after he had elaborated, digested, and methodized them, he might derive from the experimental researches of these distinguished physiologists, he could derive no assistance in the original construction of his system.

We have yet, however, to consider a still more ingenious application of the doctrines already expounded. This consists in what Bellingeri terms after Haller, Whytt, and some others, the *Antagonism* of the Nerves, *(Nervorum Antagonismus.)*

The first ideas of this doctrine, indeed, were suggested to Haller by the direct actions, and the equipoised or resistent actions of muscles; but these also he traced to the influence of nerves over the muscles, by which the actions and counter-actions were performed. As it is important to have distinct ideas of the nature of this doctrine, we subjoin the passages in which it is most distinctly and fully expressed.

Though Boerhaave had delivered pretty explicitly the doctrine of Antagonism in Muscles, and had shown the necessity of what he named antagonists, and employed the term *Antagonismus*, yet the first person by whom the term *Antagonismus* was employed, in reference to the Nervous System, was Haller in his instructive notes on the Institutions of Boerhaave; and, as his views are, if possible, rather more explicit under the chapter on Respiration, than that on Muscular Action, we shall make no apology for giving them thence. "Omnis musculus," he begins, "in perpetuo conatu est, ut partem sibi conjunctam mobilem ad alteram adtrahat fixiorem. Adeoque, ne musculus, ex conditione vitæ se contrahens, perpetuam actionem exerceat, requiritur alius musculus, qui in partes contrarias trahat vi æquali. Sit digitus, huic inseritur in ultimum articulum tendo: eum tendinem caro adtrahit ut perpetuo conetur extendere digitum. Verum sub eodem articulo alius musculus est, qui conatur, ut digitum eundem flectat. Quamdiu nunc vis voluntatis, quæcunque demum fuerit, nullum superpondium vel flexori addit vel extensori musculo, tamdiu digitus flexus erit, mediocri, quadam flexione, quia extensor nititur ut extendat, contra flexorem. Pone nunc flexorem," he continues, "subito resolvi immobilem, manente eadem vi extensoris, tunc utique subito digitus extendetur, quasi convulsione aliqua; aut contrario modo flectetur validissime, si extensore resoluto flexoris vis integra superfuerit. Hoc nunc est, quod dicimus *antagonismum*."

It is manifest, however, that, according to this description, all muscles are not opposed by antagonists; and Haller had already mentioned in a note, that the intestines have no antagonist save their contents, and the heart none except the blood. He then proceeds to add to this list the intercostal muscles in the following terms. "Verum musculi intercostales non habent hujusmodi antagonistam musculum; sed ipsis pro antagonistis sunt segmenta costarum cartilaginea, quæ vim patiuntur, dum intercostales contrahantur, et quantum possunt, renituntur; hinc, quamprimum ii musculi agere cessant, pergunt agendo vires exserunt, costasque deprimunt. Ea vero animalia, quæ prono capite incedunt, habent musculum in pectore latentem, qui a sterno ortus aliquot cortis inseritur, et has cartilagines deprimit, atque earum elaterem et antagonismum adjuvat." It may be proper to say, that he here alludes to the *triangularis sterni*, which, though small and rudimental almost in man, is large and efficient in the dog and other animals.

It was at that time a favourite doctrine among physiologists, that, as all muscular motion was conceived to depend on the influx of nervous fluid, every alternate motion depends on the alternate influx of this fluid, which was imagined at one time to distend one muscle and immediately after its antagonist. The truth of this doctrine, excluding the hypothetical imagination of nervous fluid, Haller admitted in reference to the muscles antagonized by other muscles. The circumstance, however, of various muscles, for instance, the hollow muscles of the vital organs acting independently of antagonists, and the intercostals being antagonized by the elastic force of the cartilages, was sufficient to throw some doubt on this doctrine; and Boerhaave first, and Haller more explicitly afterwards, announced the proposition, that nervous action or influence was not absolutely necessary to the due antagonism of muscular action.

"Reliqui musculi, qui antagonismum exercent, ideo obsistunt adversariis, quod perinde a liquidis suis inflentur. Obluctator musculorum intercostalium est elater cartilaginum, qui a nullo liquoris influxu pendet, et in vi solidarum partium unice fundatur. Ergo ad antagonismum non requiritur absolute determinata aliqua fluidi nervei reactio."* And in his next annotation he adds. "Et tunc elater deprimit costas, absque ulla liquoris nervei opera. Ergo sufficit ad antagonismum, ut ab una parte musculus agat ex influxu liquidi nervei, et ab altera parte solidum elasticum."†

Haller afterwards expressed the same doctrine more pointedly and explicitly both in the First Lines and in the *Elementa*; and, as the former contain his doctrines in the most condensed and abridged form, we shall adduce from that work the passage in question. After stating briefly the nature and operation of antagonist muscles, he then proceeds to assign as the cause of their action not the nervous influence, but the *vis insita* or irritability. "Ea causa est vis insita, et perpetuo operatur, etiam dum musculus agit, et quam primum accessoria ea celeritas remisit, quæ a cerebro advenit, obtinet conando, ut artus aut pars quæcunque in statum priorem reponatur, in quo statu æquilibrium est inter musculum causamque obpositam. Quoties antagonismus a musculis est, accidit, quod nullus musculus possit contrahi quin extendatur antagonista, unde distentis nervis, nato sensu incommodi, etiam magis ad restituendum æquilibrium nitatur." *

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* Hermanni Boerhaave, Phil. et Med. D. Prælectiones Academ. in proprias Institutiones Rei. Med., edidit et Notas addidit Albert von Haller, Tom. v. Part i. Goetting. 1743.

† Ibid.

This doctrine regarding antagonism in muscles has been more or less generally adopted by Soemmering, Sprengel, Barclay, Monro, and the majority of modern authors; and little if any attention has been given to the question, what is the exact influence of the nervous system on the antagonism of muscles? To this subject M. Bellingeri has directed much attention, and has endeavoured, by the aid of his anatomico-physiological doctrines, enforced as they are by experimental proofs,—to present views of the nature of antagonism, as a phenomenon of nervous influence, both new and interesting.

After expressing some doubt whether we ought to believe, that the various motions of flexion, extension, adduction, and abduction, are all indiscriminately regulated by nerves and nervous filaments issuing from the brain, the *cerebellum*, and their productions, he proposes the question, whether it is not more reasonable to think that the cerebral nerves are devoted to one species of motions, and the cerebellic nerves to motions of another order? To the latter view he avows his partiality, and more particularly, announces the proposition—that the nerves issuing from the brain regulate in general the motions of flexion and abduction, while the nerves issuing from the *cerebellum* and its processes are devoted to the motions of extension and adduction. The *cerebellum*, according to this view, antagonizes the brain; and he thinks that this inference is supported by all the proofs of human and comparative anatomy, of physiology and pathology.

In evidence of this he reminds his readers, that the fourth pair of nerves, or *motor internus* of the eye, is the antagonist of the sixth, or *motor externus* of the same organ, and that, while the former arises from the processes of the *cerebellum*, the latter issues from those of the brain. The third pair, he observes, which produces very multiplied and opposite motions, has two origins, one from the brain, and the other from the *cerebellum*; for, besides the trunk of the third pair issuing from the *crura* of the brain, it receives accessory nerves,—discovered and described by Malacarne, and delineated by Palletta,—from the *crura* of the *cerebellum*. In the tongue, also, which exercises very various and opposite motions, we find inserted nerves of cerebral and nerves of cerebellic origin; the hypoglossal issuing from the processes of the brain, viz. the pyramidal bodies,—and the other nerves, viz. the trifacial, the filament of the facial, and the glosso-pharyngeal, issuing from the processes of the *cerebellum*. The exact nature of the motions produced respectively in the eye and tongue by the filaments or nerves of the brain or *cerebellum*, he admits, are not yet determined.

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* Alberti v. Haller, Primæ Lineæ Physiologiæ, ccccxiii.

Applying these views, however, and the distinctions founded on them, to the spinal nerves, M. Bellingeri thinks that it is consistent with the anatomical structure of the spinal chord in man and animals to infer, that the posterior roots are devoted to the motions of extension, while the anterior regulate those of flexion. Thus in man, who is destined to be most frequently in the erect position, and who therefore requires to keep in action principally the extensor muscles, we find the posterior strands much thicker than the anterior, and the posterior roots, in like manner, thicker than the anterior. In the ox again, in which the extensors of the head are required to sustain that part against gravity, the posterior strands are thicker than the anterior in the cervical region, but more slender in the dorsal, where the extensors are less required to act. In a similar manner he accounts for the excessive thickness of the posterior over the anterior strands in the sacral region of birds, by referring it to the necessity from frequent and long-continued action of the extensors of the sacral extremities, in standing and maintaining the weight of the whole body.

To these facts the author next adds those derived from the phenomena of diseases, especially palsy and tetanus. In speaking of the former, he refers to the two species of palsy mentioned by Cœlius Aurelianus, as correctly observed by the ancient physicians, the one, that by contraction or flexion (*conductione,*) the other, that by extension.

M. Bellingeri then adduces, in illustration of the same principle, the fact stated of Valsalva by Morgagni, that the former was capable of distinguishing, by the mere inspection of the person, whether the pathological cause of apoplexy was seated in the brain or *cerebellum*. In the case adduced as an instance of this remarkable skill in diagnosis, there was strong and irresistible contraction of the extremities, especially the upper, yet complete relaxation of the *sphincter ani*. From these facts, therefore, since the contraction indicated the loss of power in these extensors, and relaxation of a sphincter indicates loss of its active power, Bellingeri thinks it just to conclude, that the *cerebellum* and its productions and their nerves, preside chiefly, if not exclusively, over the muscles devoted to extension.

There is no doubt of this fact, that in certain affections of the nervous system, involuntary contractions of the limbs, without any power of extending them, form the most prominent symptoms; and it must also be admitted that these symptoms depend chiefly on the loss of voluntary motion in the extensor muscles, or, in other words, on the extensor muscles ceasing to antagonize so completely as they do in health the flexor muscles. As the subject merits some attention, it may be proper to enumerate in proper order various facts of this class.

1. In certain affections of the brain and *cerebellum*, attended either with excessive congestion of blood in its vessels, or with incipient softening, especially in the latter, the superior extremities become gradually forcibly inflected and contracted, without the power of extension, and when any attempt is made to extend them, they resist it violently. A case of this kind occurred in the summer of 1833, in the Fever Ward of the Royal Infirmary of this city.

2. In cases of incipient disease of the spinal chord, more expressly chronic inflammation of the *vertebræ*, of the vertebral *dura mater*, of the *pia mater*, or of the chord itself when the disease approaches slowly, it betrays its first existence by involuntary incurvation and inflection of the lower extremities, which are either with great difficulty or wholly incapable of being extended. Thus the thighs are forcibly and deeply inflected on the belly, the legs are strongly drawn up on the thighs, and even the feet and sometimes the toes are stiffly incurvated. A beautiful example of these symptoms was presented by a boy of eight, with incipient spinal disease in the Royal Infirmary, in the months of October and November 1832.

3. In a nervous disorder frequent among infants, and often associated with the fatal distemper known by the name of Crowing Inspiration, it is one of the most common and invariable symptoms for more or fewer of the fingers and toes to be forcibly and inextensibly inflected upon the palm of the hand and soles of the feet. In the year 1829, the writer of this article had under his care a very perfect specimen of this disorder, in which first the thumbs and fore-fingers became forcibly and inextensibly inflected into the palm of the hand, and then the great toe of one foot and that of the other with two of the smaller toes were immovably inflected into the sole of the foot. The crowing inspiration ensued on two several occasions, but disappeared under the use of remedies. The case was treated throughout as a disorder of the brain and spinal chord, and of the alimentary canal;

and all the derangements in the muscular motions now mentioned disappeared, the child having since become a healthy boy.

4. In certain undoubted cases of paraplegia from injury, followed by inflammation of the spinal chord, the same inextensible contraction and inflection of the extremities, or a part of them, is occasionally seen. Thus in the extraordinary case of Domenico Valetto, described by Dr Peebles in this Journal (p. 280), as at present in the prison at Padua, it is stated, that "the toes presented a singularly contracted and shrivelled appearance, and the feet were stretched out quite stiff, on a line nearly with the *tibia*, as if by violent spasms, and the heels were drawn upwards towards the back of the legs." This appearance of the toes and the position of the feet in relation to the legs is evidently occasioned by the inordinate action of the flexor muscles, no longer resisted by the antagonism of the extensors, the nervous roots supplying which, were in all probability most affected by the effects of the chronic inflammation of the spinal chord and its membranes.

The facts now specified are insignificant and almost unintelligible if taken by themselves. But, if combined and classified, and if studied with reference to the doctrines of Bellingeri on the influence of the posterior or cerebellic strands of the spinal chord, they become invested with a high degree of interest, and promise to throw a steady ray of light on the peculiar faculties of particular parts of the nervous system, and, above all, upon the power of the nerves over certain classes of muscular organs. It is not unreasonable to assert, that, as facts are often more accurately noted and observed, when collected with the knowledge of particular theoretical principles, had the distinctions of Bellingeri been more generally known, many facts of this kind might have been preserved, which, from ignorance of their tendency, and incapacity to comprehend them, have been disregarded and forgotten, or utterly lost.

That these doctrines, however, might be still more clearly established, the author, after a view of the characteristic phenomena of *Tetanus*, proceeds to inquire to what extent these phenomena admit of explanation upon the principles already advanced?

He sets out, in the *first* place, by showing, from various authorities, that there is sufficient evidence to prove that *opisthotonos* and *emprosthotonos* are seated primarily in the nervous system, and that the cause of the former is seated chiefly and more frequently in the *cerebellum*, and that of *emprosthotonos* in the brain. At this part the author is evidently embarrassed; for he is compelled to admit, that he is unacquainted with any observations of *emprosthotonos* in which dissection showed the brain to have been affected. This difficulty he attempts to remove by conjecture; and it is perhaps the only weak and impregnable part of his theory. We think he might have obviated it in part, if not altogether, by using, instead of the term Brain, that of the Anterior Strands of the Spinal Chord and their nervous productions. This, however, we merely add by the way; and proceed to advert to his explanation.

In *opisthotonos*, he remarks, in which the extensor muscles of the head, neck, back, arms, hands and fingers, the levator muscles of the inferior jaw, the abductors of the superior extremities, the flexors and adductors of the legs, are spasmodically contracted, and the sphincter of the urinary bladder is relaxed, when he says that the *cerebellum* and its processes, viz. the posterior strands of the chord, and the posterior roots of the spinal nerves are in a morbid state;—it is manifest that the *cerebellum*, the posterior, or cerebellic strands of the spinal chord, and the posterior roots of the spinal nerves, are here understood to maintain and regulate the motions of extension in the head, neck, back, superior extremities, the hands and fingers; the elevation of the lower jaw; the abductor motions of the superior extremities; and the motion of flexion and adduction in the legs, and, in short, that of relaxation of the sphincter of the urinary bladder.

In *emprosthotonos*, on the other hand, in which the flexor muscles of the head, neck, trunk, superior extremities, hands, and fingers, and the adductor muscles of the superior extremities, the abductors of the hips and extensors of the legs, and the sphincter of the bladder is contracted, when he represents the brain, the anterior or cerebral strands, and the anterior roots of the spinal nerves to be the seat of the morbid action, this is in perfect accordance with the previous principles by which he showed that the brain, the anterior or cerebral strands, and the anterior roots, regulate the flexor motions of the head, neck, trunk, superior extremities, and hands and feet, —abduction of the upper extremities, abduction of the hips, and extension of the legs, and constriction of the sphincter of the bladder.

Bellingeri further makes some curious observations on the nervous cause of the contraction and relaxation of the sphincter of the bladder. The contraction of that muscle, he says, depends on the brain, its relaxation on the *cerebellum* and the cerebellic nerves. There is here, however, one difficulty, that the apparent loss of power in the sphincter of the bladder is often the result of mere overdistension of the bladder itself. On this point, however, our limits do not permit us to dwell.

We have now given a view of those proofs deduced by M. Bellingeri in favour of the truth of his principles regarding the functions of the different parts of the spinal chord from anatomical inspection, physiological induction, and several of the phenomena of disease. We have still to see, what degree of confirmation these doctrines can derive from experiments expressly undertaken to determine their validity. These, it will be seen, if we bear in mind the difficulty of the task, are as conclusive as the subject can admit, and, upon the whole, furnish a body of evidence, which, if not perfectly demonstrative, must, along with that already adduced, create a very strong impression in favour of the doctrine.

In undertaking these experiments, Bellingeri had five objects in view; *first*, to determine whether the posterior roots preside over the motions of extension; *secondly*, to determine whether the anterior roots regulate the motions of the flexor muscles; *thirdly*, to ascertain the respective influence of the posterior and anterior strands over the motions of the trunk and extremities, in reference to the antagonized action of the muscles; *fourthly*, to ascertain the influence of the lateral or restiform strands; and *fifthly*, to discover the exact properties of the gray matter of the chord.

Thus, in two lambs, he exposed the spinal chord by removing the spinal plates, opening the *dura mater*, and cutting on one side the posterior roots of the four inferior pairs of lumbar nerves, and the two superior pairs of sacral nerves. Immediately the motions of extension of the posterior extremity of that side were altogether interrupted, while the motions of flexion, though enfeebled, remained sufficiently free, as was evinced by the lambs, either spontaneously or when irritated, evidently bending the thigh or leg with sufficient strength; yet when these were bent, they were unable by any means, or the greatest efforts, again to extend them. In order, however, that this flexion might appear more manifest, it was necessary to extend forcibly the posterior extremity of that side on which the nerves were divided; and then, indeed, the lambs, either spontaneously or when irritated, evidently inflected the extremity; but, on the contrary, when it was entirely inflected, there was no more motion of extension.

As to sensation, Bellingeri states that he observed that tact was utterly destroyed in that extremity on the side of which the posterior roots of the nerves were destroyed; and, indeed, so complete was this extinction of tact, that the limb might be punctured and cut without any perception on the part of the animal. On the contrary, when either the opposite limb, or the pectoral extremities, or the rest of the body was even slightly affected, the sensation of pain was exquisite, and the animals either tried to escape or uttered a plaintive cry. He remarked, also, that all the motions of flexion and extension remained unimpeded in the pelvic extremity of the side in which the nerves were undivided.

These experiments were continued for two days, that there might be no fallacy or doubt; and the author repeated them on a horse on the 31st of October 1823, in the presence of the veterinary Professors *Lessona* and *Mangosio*, and their pupils. Though this was a laborious and by no means easy experiment, by reason of the depth of the parts to be divided, yet its results were equally conclusive.

As soon as the posterior roots of the four inferior lumbar nerves on the left side were divided, immediately the left abdominal extremity ceased to have the power of extension, while its flexor motion remained. When the limb was extended as far as practicable, the animal, spontaneously or upon irritation, inflected it; but conversely, when inflected, he was quite unable to extend it or move it for a single line.

The sensation of touch was found to be extinct in the same extremity; but as this sense was abolished over the whole body, even as to the perception of pain, so that the animal felt neither punctures nor incisions, the author draws no conclusion from this circumstance. He adds, however, that, as the animal lived only three hours, and as the experiment was evidently a very painful one, it was possible that this general *anaesthesia* might be the result either of intense pain, the shock of the operation, or the profuseness of the hemorrhage.

The experiment is manifestly one from which it is difficult to draw conclusions altogether free from objection; and in attempting it in another horse, the animal expired during its performance in consequence of injury of the chord.

In the same manner, Bellingeri undertook to ascertain experimentally the direct influence of the anterior roots of the spinal nerves on the muscles. After dividing, in a lamb, the anterior roots of the last pair of lumbar and the first pair of sacral nerves, he found that the right pelvic extremity continued permanently extended, and the extensor tendon passing over the knee was found perfectly tight. Whenever the limb was bent by the hands of the operator, it was immediately, when left to itself, again extended; and the animal never, either spontaneously or when irritated, bent the extremity, except the foot. The left pelvic extremity, on the other hand, was moved freely in every direction.

The sense of touch over the whole body, and even in the right pelvic extremity itself, remained uninjured; as was evinced by the animal, when slightly punctured, giving indications of pain or shrinking. These phenomena were observed for the space of twenty-four hours.

This experiment, the author infers, proves that the anterior roots of the spinal nerves are subservient to the motions of flexion in the hinder or pelvic extremities of quadrupeds, and are by no means devoted to touch or tact. In this respect, therefore, his inferences regarding the functions of the anterior roots accord with those deduced by Magendie.

After the lapse of a day, Bellingeri proceeded to divide the anterior roots of the nerves on the left side; but subsequent inspection showed that both the anterior and the posterior roots of the first and second pairs of sacral nerves were divided. Immediately after division, which was accompanied with profuse hemorrhage, perfect palsy, both as to touch and motion, in both pelvic extremities, ensued.

The animal lived only twelve hours; and upon inspection the cause of the complete palsy was manifest. Much blood was effused between the *dura mater* and the body of the *vertebræ* in the lumbar and sacral regions. Clots of blood also were found in the cavity of the *dura mater*, and especially within the posterior and anterior roots of the lumbar and sacral nerves,—sufficient, certainly, to explain the general palsy. The anterior surface of the spinal chord was slightly reddened in the lumbar and sacral regions, the kidneys reddened and covered with lymph, and the mesentery much inflamed.

Bellingeri, however, having found that experiments of the kind requisite performed on the spinal chord of warm-blooded animals were attended with great inconvenience, and were liable to give rise to fallacious results, in consequence of the injury necessarily inflicted on the system, and also in consequence of the excessive hemorrhage, being itself always a cause of feebleness of the muscular motions, and not unfrequently one of death, undertook to obviate this source of fallacy by repeating the whole of the experiments on frogs. The posterior roots of the lumbar nerves were divided in the presence of the late celebrated Professor Vassalli-Eandi; and invariably with the effect of extinguishing sensibility in the member of the same side, and destroyed all power of extending the hinder limbs.

By dividing in the same manner the anterior roots of several of the lumbar nerves, he found, conversely, that the sensation of tact remained unimpaired, while the motions of flexion were utterly destroyed. From these phenomena, which were observed for the space of half an hour, after which the animals expired, the author infers that the anterior roots of the lumbar nerves are not subservient to touch, and determine only motions of flexion in the pelvic extremities.

The next experiments of Bellingeri were made upon the posterior strands of the chord in two lambs. This division, as was ascertained by subsequent examination, was made transversely from the one posterior lateral *sulcus* to the other, penetrating to the contact of the gray-coloured matter in the axis of the column, but without touching the posterior peaks of that matter;—so that the posterior strands of the chord only were completely divided. In both cases the posterior extremities were rendered immediately completely paralytic; but by attentive observation it was discovered, that the motions of flexion, though feeble, still remained in each extremity; so that the animal, either spontaneously or when irritated, bent the limbs specified a little. The motions of extension of the pelvic extremities, however, were entirely destroyed; and when the posterior extremities were extended by adventitious means, the animals still bent them; but when, conversely, they were inflected, the animals were unable to extend them in the smallest degree. This state of the motions was observed for the space of thirty hours.

This experiment shows, in opposition to those of Magendie, the author observes, that the posterior strands of the spinal chord exercise very great influence over the motions of the body; and they farther show, that these strands, by means of the nervous filaments issuing from them, preside over the motions of extension of the pelvic extremities in quadrupeds.

Upon examining the state of the sense of touch, Bellingeri found that, from the performance of the experiment till death, it was completely unimpaired, and remained perfect in the posterior extremities as in other parts of the body.

The reason of this peculiarity, viz. the destruction of the motion of extension, and the persistence of tact, upon dividing the posterior strands, Bellingeri explains in the following manner. The posterior strands of the chord consist of whitish nervous matter, which, according to his previous doctrines, serves exclusively to the performance of motion. From these strands proceed several filaments of the posterior roots of the spinal nerves, which are also devoted to motion; hence when the posterior strands alone are divided, those filaments only of the posterior roots which issue from the posterior strands become paralytic, and hence no motions take place. Touch, however, remains unimpaired from this circumstance,—that the filaments of the posterior roots, issuing from the posterior peaks of the gray matter, and which, according to Bellingeri, preside over sensation, cannot be affected by palsy in these experiments;—in which the posterior *cornua* or peaks are untouched. Conversely, while the posterior roots of the spinal nerves are divided, all the filaments of these roots are attacked with palsy, since the communication between it and the brain is cut off;—hence ensue perfect *anaesthesia* and palsy of the motions of extension.

These experiments, Bellingeri further maintains, prove that the white matter of the spinal chord, and the nerves issuing from it, are appropriated to motion; and that the gray matter and its filaments are chiefly appropriated to the senses and touch.

If these conclusions be well founded, Bellingeri adds, it must follow, that in simple *anaesthesia* or loss of sensation, the lesion is situate in the gray matter of the chord; that, in palsy or loss of motion, the white matter must be in fault; and that in palsy, both as to sensation and motion, both substances are affected. This further explains the fact long ago noticed both by Pouteau and Cullen, that in certain palsies motion is abolished, while sensation remains, and that in others sensation is extinct, while motion is little affected. It further explains another fact, that simple palsy as to motion without affection of sensation is most frequent, and that simple *anaesthesia* is a very rare occurrence, since the former is much more exposed to the causes of injury and disease than the latter, which, being situate in the centre of the chord, is comparatively sheltered. Are the cases recorded by Dr Yelloly in the third volume of the Medico-Chirurgical Transactions to be ascribed to lesion of the gray matter?

From some other experiments detailed in the third memoir, Bellingeri infers that the filaments which effect relaxation of the sphincter of the urinary bladder also issue from the posterior strands, since their division is followed by involuntary emission of urine. As to the *rectum* he could form no very positive conclusion.

In the same manner did Bellingeri undertake to determine the influence of the anterior strands upon the muscular motions, with the following results. In a lamb, in which all the anterior strands were completely divided, the sense of touch remained, though somewhat enfeebled in the abdominal extremities; but the power of flexion was utterly destroyed, while that of motion remained. In another lamb, in which the right anterior strand only was completely cut across, the sense of tact remained in the right pelvic extremity, but less than that in the opposite; but the motion of flexion in the right pelvic extremity was completely destroyed, while strong motion of extension of the same extremity continued;—and in the left pelvic extremity sense and motion in both directions were unimpaired.

These experiments show that the anterior strands have little or no influence over the sense of touch, and preside only over the motions of flexion in the pelvic extremities, not of those of extension; and, by comparing them with the experiments on the posterior strands, he concludes that perfect antagonism as to motion subsists between the anterior and posterior strands of the spinal chord;—the latter presiding over the motions of extension, and the former producing motions of flexion.

Bellingeri proceeds in the same manner to investigate the influence of the lateral or restiform strands of the chord,—a task, it may be imagined, of some difficulty, considering the position of these strands in the column. The division of these parts did not impair any of the voluntary motions; for flexion, extension, adduction, and abduction, were as freely performed almost as before. He admits, however, that the movements were not so vigorous as formerly, and that the lambs thus operated on could neither walk nor support themselves on the posterior extremities. Sensation was little affected. It appears, however, that these strands have a special influence on the functions of the rectum and bladder.

With the view of making his investigation complete, Bellingeri proceeded, in the last place, to ascertain by experiment the properties of the gray matter of the spinal chord. By driving a knife into the posterior lateral furrow of the chord, so as to injure the posterior margin of the gray column on the left side, he destroyed it longitudinally for the space of an inch,—without affecting sensation in that extremity. Several times he tried to destroy the gray matter without affecting either sensation or motion. At length, by cutting the gray matter in the centre of the chord, and carrying the knife laterally, so as to remove the posterior *cornua* of the lateral scoops, he found that sensation and touch were completely extinguished in those extremities, yet motion entire. From this he infers that the gray matter contributes to sensation but not to motion.

From some other experiments performed on this gray matter, the author found that at first sensation was painfully and exquisitely augmented. But in order to determine the exact influence of the gray matter with greater precision, he performed the following experiment.

He introduced into a transverse section of the gray matter a plate of wax, so constructed and situate as to divide only and completely the gray matter. In the course of this, he saw that the chord was attacked with inflammation. When this plate, however, was introduced, it was evident that common sensibility was so completely extinguished in the posterior extremities, that they could not only be touched, but even punctured and lacerated without any sensation to the animal. The plate was left for half an hour, at which time sensibility was completely gone, and there was complete *anaesthesia*. The plate was then withdrawn, when sensibility immediately returned, but in a less degree than natural; and in this state it continued in the posterior extremities for about two hours, when the lamb, seeming near death, was killed.

After death, upon removing the gray matter between the last pair of dorsal nerves and the first lumbar, this matter was found reddened and inflamed.

From these facts, the author infers that the gray matter only contributes to sensation; that in so doing it is not necessary that it be continuous but merely contiguous; and that during inflammation of the gray matter, the common sensibility of the chord is augmented.

The last subject in the investigation of Bellingeri to which we propose at present to advert, is the inquiry into the functions of the accessory spinal nerve. This nerve, which he had shown to come from the lateral or restiform strands of the spinal chord, ought, according to the hypothesis, whatever be its distribution, to minister to involuntary or instinctive acts only. It forms, after its emergence upon the neck, two branches, an internal and an external. The first is distributed to the pharynx, is connected with the pneumogastric nerve, and forms a ganglion, which eventually transmits filaments to the same organs as the pneumogastric nerve. The second, after sending a few twigs to the Sterno-mastoid muscle, is chiefly exhausted in the *Trapezius*, anastomosing with the second, third, fourth, and fifth pairs of the cervical, and some of the dorsal nerves.

Now in this distribution, Bellingeri justly remarks, that there is no doubt that the internal branch is distributed to organs which minister to organic and involuntary functions, since the lower region of the pharynx, and the organs of the chest and belly, are completely beyond the dominion of the will. The only question, therefore, is that regarding the distribution of the external branch. On this point, however, it is to be remarked, that though the Sterno-mastoid and *Trapezius* muscles perform voluntary motions, they are, nevertheless, employed instinctively, and perform involuntary acts, which indicate certain states of the mental emotions, for instance, humility and patience, and in certain involuntary motions connected with laborious or irregular respiration. The filaments of the external branch of the accessory nerve, therefore, Bellingeri infers, are distributed to the muscles now specified, for the express purpose of placing them under the influence of the lateral strands of the spinal chord, and, consequently, under that of the restiform bodies. It is unnecessary to specify the numerous sympathies which this distribution explains.

Lastly, M. Bellingeri observes, that the accessory nerve is exclusively distributed to organs of motion, and not at all to those of sensation, no part of it being sent to the skin.

Here, for the present, we must conclude this long and perhaps rather tedious account of the researches of Bellingeri on the Structure and Functions of the Spinal Chord and its Nerves.

On the value of these experimental researches, and on the validity of the conclusions thence deduced, it is unnecessary for us to express any opinion. That all his reasonings are accurate, all his arguments are conclusive, all his observations and experiments unobjectionable, and all his conclusions perfectly well founded, it would be unreasonable to expect, and too much to assert; and we cannot be charged with an unreasonable degree of caution, or any disrespect to Bellingeri, if we say, that, upon questions so complex, and involving conclusions so important, it would be desirable that the experiments should be repeated by other unbiassed observers. We must nevertheless admit, that they appear to contain a large proportion of the necessary ingredients in a good theory. When, indeed, we consider the extreme obscurity in which the subject is involved, the complexity of the inquiry, the difficulty of obtaining exact results, and of ascertaining, above all, the influence of particular parts of a system so mutually interwoven and connected, it appears not only natural, that there may be some defective links in the chain of evidence, but wonderful that there should be, upon the whole, so few, and that the author has been enabled to present a view so consistent, so uniform, and so free from objection.

True or false, well founded or prematurely announced, one thing is certain. The knowledge of the distinctions made by Bellingeri, and of the properties which he assigns to the different strands of the spinal chord, and the different nervous filaments to which they give origin, will henceforth be of the utmost utility in directing the attention of physicians and surgeons to the observation of the phenomena of nervous diseases, and especially of those of the spinal chord; and the facts collected in this manner will contribute eventually to confirm or refute, to modify or rectify, the principles inculcated by the present author.

Meanwhile we must observe, that if the facts, the arguments, and the experimental deductions now stated, be held adequate to establish the truth of the doctrine of Nervous Antagonism, an explanation is afforded of a great number and variety of phenomena in the muscular motions of the human body in its healthy and diseased state. Thus, the admission of these principles explains not only the ordinary Antagonism of the muscles of the extremities, and their occasional morbid derangements, but the relaxation of sphincter muscles, the involuntary contraction or inextensible flexion of the fingers and toes in the spinal irritation of infants, and the spasmodic croup, crowing inspiration, and similar affections of the larynx.

It is important to observe also, that this doctrine of Nervous

Antagonism, as stated and explained by Bellingeri, corresponds in every respect almost with that recently brought before the Royal Society of London by Dr Marshall Hall, under the denomination of the Reflex Function of the *Medulla Oblongata* and *Spinalis*. It explains all the phenomena which that doctrine explains, and we think, on the whole, in a more natural and consistent manner. This subject, however, we shall consider elsewhere.

Art. II.—*An Inquiry into the Nature of Sleep and Death, with a view to ascertain the more immediate causes of Death, and the better regulation of the means of obviating them. Republished by permission of the President and Council of the Royal Society, from the Philosophical Transactions for* 1827, 1829, 1831, 1833, *and* 1834, *being the concluding part of the Author's Experimental Inquiry into the Laws of the Vital Functions*. By A. P. W. Philip, M. D., F. R. S. L. and E. 8vo. London, 1834. Pp. xix. and 254.

The present volume contains the concluding part of Dr Wilson Philip's Experimental Inquiry into the Laws of the Vital Functions. It consists of an introduction, of a reprint of seven papers from the Philosophical Transactions, and an Appendix. The first is on the functions of the nervous system, and the relation which they bear to the other vital functions; the second on the effects of dividing the nerves of the lungs, and subjecting them to the influence of Voltaic electricity; the third on the function of digestion; the fourth on the source and nature of the powers of circulation; the fifth on the relation subsisting between the nervous and muscular systems in the more perfect animals, and the nature of the influence by which it is maintained; the sixth on the nature of sleep; the seventh on the nature of death; and the appendix consists of a reprint of two papers in a reply to some observations of Dr Prout in his Bridgewater Treatise. It is to the sixth and seventh papers that we shall confine our analysis.

The cause of sleep has for ages occupied the attention of the most eminent physiologists and psychologists, without producing any very satisfactory explanation of the phenomenon, so that, with the late Professor Dugald Stewart, one would be apt to declare that it was a subject placed altogether beyond the reach of the human mind. The earlier physiologists maintained that the proximate cause of sleep was a deficiency or exhaustion of the animal spirits,—an opinion which, as it was founded on an erroneous view of the functions of the brain, readily fell into oblivion when the structure and uses of the various organs of the body were more studied and better understood. The next hypothesis which obtained favour was, that sleep depends upon a certain degree of compression, to which the brain is subjected, by the accumulation of blood in its vessels,—an opinion brought forward anew by an anonymous writer in the second volume of the Quarterly Review, where the doctrine is clearly stated, but not supported by facts or reasoning. But the state caused by pressure on the brain, though it resembles sleep, in producing a cessation of all the faculties, differs much from it in various circumstances, such as in its being neither refreshing nor easily interrupted, and when interrupted, in being renewed immediately on the withdrawal of the stimulus. Sleep, moreover, is induced in circumstances in which it is next to impossible that accumulation of blood can have taken place in the brain. Cullen's notion, when stripped of the phraseology made use of in consequence of his belief in a nervous fluid, amounts merely to this, that a state of action is necessarily followed by a state of repose.

The theory of Bichat is similar. According to him the animal functions have an alternate action and repose. This repose, if of long duration, and shared by several functions, constitutes sleep, and the greater the number of functions involved, the deeper the sleep. Blumenbach attributes sleep to a diminished or impeded flow of arterial blood to the brain; to refute which it is merely necessary to observe, that a state far different from sleep would be the result of such an occurrence. According to Magendie, perfect sleep results from a suspension of the action of the relative organs of life, and from a diminution of the action of the nutritive functions.

This he supposes to be the immediate effect of the laws of organization, and to be inexplicable by any of the physical causes mentioned by authors. There is yet another theory of which the most that can be said is, that it is ingenious. When a man falls asleep he breathes more slowly, less carbon is given out, and some of its compounds accumulate in the blood, and are applied to the brain, and, in consequence of their soporific effects, keep the person asleep.

The question then comes to be, how is sleep induced? The answer given is, that the exhaustion consequent on exertion diminishes irritability to that point at which external objects prove scarcely a stimulus, and then the individual is said to be sleepy; add to the exhaustion or withdraw the stimulus, excitement is no longer felt, and the man drops asleep. But before sleep, the pulse and breathing are slower, from the previous exhaustion, and, consequently, the accumulation of more of the compounds of carbon goes on. During sleep, however, the irritability lost during the day is repaired, the sum of the excitability counterbalances the sedative effect of the gas, and becomes subject to the stimulus of the external world, and the man awakes. In corroboration of this opinion, it may be stated, that it has been ascertained that least carbon is given between nine P. M. and nine A. M. On reviewing these different hypotheses, that which attributes sleep to a law of the organization, that exhaustion must always follow exertion, will appear to be the most reasonable of them. Dr Wilson Philip's views differ very considerably from all those now given, and are founded upon the particular doctrines which it has been the business of his life to establish. We cannot do better than give his own summary of his opinions regarding sleep. "From a review of the whole of the facts which have been laid before the Society, it appears, 1. That in the brain and spinal marrow alone reside the active parts of the nervous system.

"2. That the law of excitement in the parts of these organs, which are associated with the nerves of sensation and voluntary motion, is uniform excitement followed by proportional exhaustion, which, when it takes place to such a degree as to suspend their usual functions, constitutes sleep; all degrees of exhaustion which do not extend beyond them and the parts associated with them being consistent with health.

"3. That the law of excitement of those parts of the brain and spinal marrow which are associated with the vital nerves is also uniform excitement, but which is only, when excessive, followed by any degree of exhaustion, no degree of which is consistent with health.

"4. That the vital, in no degree partaking of the exhaustion of the sensitive system in sleep, only appears to do so from the influence of the latter on the function of respiration, the only vital function in which these systems co-operate, in consequence of which its organs, without being in any degree debilitated, are less readily excited.

"5. That the law of excitement of the muscular fibre, with which both the vital and sensitive parts of the brain and spinal marrow are associated, is interrupted excitement which, like the excitement of the vital parts of these organs, is only, when excessive, followed by any degree of exhaustion. And

"6. That the nature of the muscular fibre is every where the same, the apparent differences in the nature of the muscles of voluntary and involuntary motion depending on the differences of their functions of their relation to the brain and spinal marrow, and of the circumstances in which they are placed"—Pp. 148, 149, 150.

The following are his views of dreaming. "Had we, independently of experience, been made acquainted with the nature of sleep, we might have foretold that dreaming, pretty much as we find it, would be its consequence.

" We here find the sensitive parts of the brain to which the powers of mind belong, and the parts associated with them, in a state of exhaustion, but not such exhaustion as prevents their being excited by slight causes, while other parts of the system are still in a state of activity. But it is only in the most perfect state of health and such as we rarely enjoy, that the vital functions are performed without slight causes of irritation arising in some of their various and complicated processes, which tend to disturb the repose of the sensitive parts of the brain. Thus it is that indigestion and other internal causes of irritation produce dreaming. Such causes act partially, and therefore only partially excite those parts.

" It seems greatly to influence the phenomena of dreaming, that, in order to favour the occurrence of sleep, and thus, as far as we can prevent unnecessary exhaustion, means are always employed at its accustomed times to prevent as much as possible the excitement of the external organs of senses, and consequently those parts of the brain associated with them. This renders us the more sensible to causes of excitement existing within our own bodies, while, by the inactivity of the parts of the brain which are associated with those organs, we are deprived of the usual control over such parts of the mental functions as are thus excited; the effect of which is greatly increased by the rapidity of the operations of the memory and imagination, when not restrained by some of the various means employed for that purpose in our waking hours. These are often objects of the senses, as written language, diagrams, sounds, and sometimes even objects of touch; but the most common is the mere use of words independently of any object presented to our senses.

" Any one may easily perceive how difficult it is to pursue a train of reasoning without this means of detaining his ideas for the purpose of steadily considering them and comparing them together. Now, in sleep, in consequence of the excitement of the brain being so partial, we are deprived of all these means; and our ideas pass with such rapidity as precludes all consideration and comparison. Our conceptions, therefore, are unconnected by experience, and we are not at all surprised at the greatest incongruities. Why should we be surprised at our moving through the air, when we are not aware that we have not always done so? The mind of the dreamer differs from that of the infant in having been variously impressed, and, therefore, in the capability of having its impressions recalled. But it is only as far as it is excited that any impression can be recalled. With the exception, it is as void of the results of experience as the mind of the infant; and therefore, in its partial excitement of the means of correcting any particular train of ideas suggested. In general, there is neither time nor means for reflection, and, consequently, there can neither be doubt nor hesitation.

" Such is the rapidity of our thoughts in dreaming, that it is not uncommon for a dream excited by the noise that awakes us, and which, therefore, must take place in the act of awaking, to occupy, when put into words, more than fifty times the space in the relation. It is a good illustration of what is here said that when we dream that we are conversing, and thus obliged to employ words, the usual incongruities of dreaming do not occur. The ideas are sufficiently detained to enable us to correct the suggestions of the imagination. No man ever dreamt that he was telling another that he had been flying through the air.

"Thus the peculiarities of dreaming arise from the partial operation of the causes of disturbance, and some of the sensitive parts of the brain being capable of excitement without disturbing the others, and thus it is that the more near we are to awaking, the more rational our dreams become, all parts of the brain beginning to partake of the excitement; which has given rise to the adage, that morning dreams are true."—Pp. 150-153.

Perpetual change forms an essential part of the constitution of all organized bodies. The successive changes which each organ undergoes after it has reached maturity tends gradually to incapacitate it for the performance of its functions; and, by the time that man has reached the first period of senescence, some have completely lost their action, others have been absorbed, and a few continue in a languid and deteriorated manner to perform their functions. Finally, these too cease; and when all the functions necessary to life thus terminate, death ensues. The various steps by which this takes place have been investigated by various authors, the opinions of a few of whom we shall cite.

Boerhaave conceived that the texture of the parts was destroyed by the friction produced by the motion of the fluids through the vessels,—that the fluids themselves gradually acquired an acrimony, and their elements are transformed into such as constitute solid substances. The partial obliteration of the vessels, their increased rigidity of structure, and the diminished proportion of the fluids, appear to him to be the principal agents in producing decay and dissolution. To these views of Boerhaave Haller added others. According to him, not only is the solidity of the body increased and the elasticity diminished, but its contractility and sensibility are also lessened. Cullen followed in the same path. Assuming that the distribution of the blood varies at different periods of life,—that, as life advances, the fluids circulate with greater difficulty, both on account of the diminished power of the heart and the increased resistance of the vessels,—and that the irritability of the moving fibres and the energy of the brain are at the same time constantly diminishing,—he deduces from these principles his explanation of increase, decay, and death. To the causes mentioned by Cullen, Dr Bostock adds the overthrow of the balance between secretion and absorption, and the derangement of the process of assimilation. Bichat inferred from his experiments that the black blood as well as the red is capable of exciting the left side of the heart, but that the red blood only can produce in the various organs the excitement necessary for the maintenance of life, from which he deduced the doctrine, that death ensues from defect of respiration, not because the heart ceases to act on the blood, but because the blood cannot excite the organs into which it is thrown. Now, it will be seen that none of these writers have at all touched upon the proximate cause of death, with the exception of Bichat, who did not push the inquiry far enough.

Dr Wilson Philip conceives that he has established by his experiments this doctrine, "that in the more perfect animals there are three distinct classes of functions, the sensorial, the nervous, and the muscular, which, having no direct dependence, are yet, through their organs, dependent on each other,"—that what is called death consists in the loss of the sensorial functions, while the nervous and muscular still continue. These are lost in consequence of the failure of the respiration, the only vital function, in Dr Wilson Philip's opinion, "to which the co-operation of sensorial power is necessary. Dismissing, as tending only to perplex the question, the various hypotheses formed to explain why the motions of the heart and blood-vessels are not subject to the will, Dr Wilson Philip proceeds to explain his view of the matter. According to him two conditions are necessary to render a muscle subject to the will; *first*, that the stimulus which excites it must be under the influence of the will; and, *secondly*, that the muscle must be capable of effecting the desired end. Now, the heart and blood-vessels being excited by the blood, which is not under the control of the will, and these organs being incapable of performing any act of volition, according to this hypothesis they cannot be under the influence of the will.

"When the animal no longer feels and wills, his breathing ceases, and he is, according to the acceptation of the term, dead, although his body still retains its other powers, which, while they last, prevent its obeying the laws of inanimate nature; but the changes which after this take place, of course no more affect the individual than if they took place in any other mass of matter

"In inquiring into the physiological nature of what is called death, therefore, it is to the ceasing of the sensorial functions alone that the attention must be directed. Thus the subject divides itself into two parts; the final loss of the sensorial functions, which in common language, has obtained the name of death; and absolute death, that is the loss of all the functions which we shall find in the more perfect animals, is the necessary consequence of the loss of the sensorial functions." The latter belong to those parts of the brain and spinal marrow which are associated with nerves of the sensitive system, and on which the power of all other parts of the system depends. In them will be found the immediate cause of failure, whether temporary or final, of the functions of the sensitive system; and in them, consequently, is to be found the immediate cause, not only of sleep but of death also. Both the state immediately preceding what is commonly called death and sleep depend on a failure in the functions of the same organs. The most evident difference between them is, that the one is temporary, the other final; and thus the state of the sensitive system immediately preceding what ought to be strictly called a natural death, differs from its state in sleep only in degree. Sleep is uniformly owing to the excitability of the sensitive parts of the brain and spinal marrow being diminished by the ordinary stimulants of life. A loss, however, of excitability in them is never the sole cause, and sometimes no part of the cause, of death. In sleep they regain their functions, in consequence of their excitability being restored by the continued vigour of the vital system, the powers of which must fail before the exhaustion can be rendered permanent, and thence it may be inferred that the powers of the sensitive system, whatever be its state, must fail when the vital system is impaired.

Proceeding on these principles, Dr Wilson Philip divides death into two species, the natural and the violent, which he discusses separately. By natural death he means the dissolution consequent on old age, and failure of the various organs, the state preceding which species differs from sleep in no other than in the sensorial and vital functions being less vigorous. "The only difference between the last and the sleep of former times is, that the exhaustion of the sensitive system, which is at first, as in the latter case, only partial, becomes in its continuance, in consequence of the failure of those powers which formerly restored the sensitive system, complete." He accounts for the death of old age occurring generally during sleep in the following manner. In sleep, though the vital functions do not participate in it, they are temporarily impaired by the exhaustion of the sensitive system. Respiration, which depends on this system, is less frequent, and, consequently, the activity of the functions depending on it, is temporarily diminished. Death then arising from the gradual failure of these functions, necessarily occurs when they are most impaired. If the vital functions can still, under the disadvantage of impeded respiration, restore the sensitive system, there is nothing to prevent them, if the decay be gradual, from maintaining its functions during the short interval which elapses before sleep again exposes them to the same difficulty.

"Their failure necessarily takes place at the time when their functions are most difficult. The death of old age, therefore, is literally the last sleep uncharacterised by any peculiarity." Such a death cannot be painful. The general languor of the functions in the last waking interval is attended with no peculiar suffering, and the last sleep commences with the usual grateful feelings of repose; the last feelings experienced; for with what takes place after them, the feelings being suspended, have no concern."

Dr Philip goes on to remark, that this species of death, which can alone be called natural, is of rare occurrence, and that, of the various instances of dissolution which he has witnessed, none could be looked upon as wholly the effect of age. All other kinds, except that now described, he looks upon as more or less violent. Death, however, must not be confounded with the suffering which precedes it, and which is often as intense when recovery is the result. From whatever causes it arises, death is in all cases essentially the same. The sensorial functions first fail. In all Dr Wilson Philip's experiments, the nervous and muscular survived the sensorial. Thus, though an animal is said to be dead when feeling and volition have left him, the motion of the blood and the assimilating process still go on for a short time.

Though the causes which accelerate the decay of our frames are of infinite variety, it is possible to reduce their ultimate effects by which death ensues, to a few general heads. Dr Wilson Philip arranges them under five heads, a summary of which we give in his own words.

"1. The only natural death, that from old age, where all the powers of life, in consequence of the operation of the agents which excite their organs, gradually decline, and death is only the last sleep characterised by no peculiarity, in which these powers, partly from their own decay, and partly from the lessened sensibility increasing the difficulty of restoring the sensitive system, become incapable of this office, in consequence of which the individual awakes no more; for it is to be recollected that it is not in the commencement but in the progress of the last sleep that what we call death takes place. In its commencement we have seen the sleeper may always be roused by stronger stimulants than those which precede it.

"All the other forms of death, it appears from what has been said, may be regarded as more or less violent, some adventitious cause disturbing the natural process. They were divided into two classes, in the one the offending cause makes its impression on the sensitive, in the other on the vital organs. The former were divided into those cases in which the debility which precedes the total loss of sensibility arises from the excess of the stimulant operation of the offending cause, and those in which it is the direct effect of that cause; the latter into those cases in which the vital powers fail, in consequence of their organs being deprived of the stimulants which excite them, and those in which the offending cause makes its impression on these organs themselves, the power of which, analogous to the operation of the offending cause on the sensitive organs, is destroyed either by the excess of its stimulant, or its more directly debilitating operation, according to the nature or degree of that cause. Thus are induced,

" 2. The death which in its nature most nearly resembles the death of old age, that from excessive exhaustion of the sensitive system, from the operation of stimulants of greater power than this system can bear, notwithstanding the intervals of such imperfect repose as their continued operation admits of, without the supervention of disease ; which, not being capable of relief from the continued action of the vital parts of the brain and spinal marrow, by sympathy spreads to them, the affection of each system increasing that of the other till all the powers of the sensitive system are destroyed.

" 3. The death in which disease of the sensitive system arises not from causes over-exciting, but directly debilitating it ; the debility they produce being of the same nature with that from excessive excitement, and running the same course as in the second stage of the preceding form.

" 4. The death which arises from the privation of the natural stimulants of the organs of life ; and lastly,

" 5. That which arises from diseased states of those organs analogous to the states produced in the organs of the sensitive system by the causes which make their impression on them."—Pp. 224, 225, 226.

The physiological nature of death is thus referable to very simple principles. In natural decay, the excitability of the organs is gradually impaired by those stimulants, by the impression of which the functions of life are maintained. In the different kinds of violent, excepting that caused by a failure of the natural stimulants of the vital organs, the excitability of the sensitive or vital systems or both, or of some parts of one or both of them influencing the others, is " more quickly destroyed by the continued operation of causes which either stimulate beyond the limits of health, or applied beyond the limits of their stimulant operation, destroy the powers of life, either by directly destroying the powers of the sensitive system, or depriving it of those powers by which it is maintained. All these causes, it is evident, tend to the same effect, the extinction of the sensibility, which constitutes death according to the common acceptation of the term, the immediate cause of which, therefore, exists in the sensitive parts of the brain and spinal marrow. Thus it appears that in every instance what is called death and the loss of sensibility are one and the same thing, and, therefore, that the last act of dying can in no instance be an act of suffering."—Pp. 227–228.

We have not entered upon the experiments and reasoning on which Dr Wilson Philip established his opinions. It would have been impossible to have touched upon these, without discussing at length all this learned author's doctrines. From the conclusions which we have given, it appears that the backneyed sentiment of death being but the last sleep and the termination of suffering, is after all literally true. If the great end of the healing art is, as all science ought to be, to increase the sum of human happiness and diminish the amount of misery, assuredly Dr Wilson Philip has contributed not a little to the attainment of this object. If his views be correct, which we believe them so far to be, those struggles which to the bystanders appear so horrible, are unfelt by the patient himself, and the last act which closes this earthly scene is attended by the same feelings as thé falling after fatigue into a gentle and tranquil sleep. Death then is now stripped of all its horrors, and, by the combined light of rational religion and physiology, we are taught that a well spent life,—well spent both morally and physically—can alone insure a tranquil death.

In conclusion we may remark, that this is perhaps the most interesting of Dr Philip's works. We would suggest to him, however, now that his inquiries have terminated, that he would consult his reputation by forming his detached papers into one continuous work, and bestowing somewhat more pains on his language than he has hitherto done. In perusing his various publications, we have more than once been brought to a pause not only by the length and intricacy of his sentences, but very often by the involved manner in which he expresses his ideas. Whether it be from slowness of apprehension or not we cannot say; but repeatedly have we found, that after we had arrived at the close of a sentence, we had completely lost sight of the connection between the premises and the inference which the author was wishing to establish, and only recovered after tracing him again, and separating his several propositions from each other. We have only to appeal to the good sense of Dr Philip, to ask, whether it not be desirable that his meaning be intelligible at a less degree of effort? All these evils may be easily remedied by a little care; and we anxiously hope that he will bestow the necessary pains.

It is almost needless to add, that we heartily recommend the work to the perusal not only of professional men, but of all those who feel interested in the manifold inquiries to which our position in this world gives rise.

Art. III.—*Des Convulsions chez les Femmes pendant la Grossesse, &c.* — *On Convulsions during Pregnancy, during Labour, and after Confinement.* By A. Velpeau, Surgeon of the Hospital de la Pitie. 8vo. Paris, 1834. Pp. 136.

It is well known that there are three periods at which convulsions in women are most apt to occur, 1*st*, during the latter months of pregnancy; 2*d*, during parturition; and 3*d*, within twelve or fifteen days after delivery;—that these convulsions are more or less general, the paroxysms more or less frequent, and the intervals between them longer or shorter;—and that they terminate sometimes in health, sometimes in death, and not unfrequently in some other disease. In the present state of our knowledge, it may be convenient thus to speak of puerperal convulsions as a separate disease, of which there are several varieties; but it must be evident to any one who will reflect on the subject for a moment, that they are in reality the effects of some other disease or diseases, of which they constitute at one time the primary, at another the secondary, symptoms. To the discovery of the primary disease the attention of pathologists has not undeservedly been directed; for, until it be clearly demonstrated upon what functional or organic lesion they depend, the treatment of the most skilful physician must be so far empirical, and consequently, unsatisfactory. Though upon this part of the subject the work before us throws little or no light, yet an account of the results of the practice of an able investigator like M. Velpeau must always be considered to be highly valuable. Reminding the reader, then, that M. Velpeau has already distinguished himself by his writings on anatomy, pathology, surgery, and midwifery, we proceed to examine the treatise before us.

After giving a definition of the word *convulsion*, M. Velpeau considers the subject under six heads, 1*st*, The forms, species, and frequency; 2*d*, The causes; 3*d*, The symptoms and progress; 4*th*, The terminations; 5*th*, The *post mortem* appearances; and 6*th*, The treatment. Each of these occupies a separate chapter, besides which there is one devoted to cases illustrative of the author's views. We shall follow the author's arrangement; and, as the subject is of great importance, devote a section to each separate head.

1. *Definition.*—Convulsion is more easily distinguished than defined. According to our author, it is characterized by hasty, anormal and involuntary motions of the locomotive system, or of some *viscus*; and every morbid state accompanied by such motions is a convulsive disease. When such motions are produced with a certain regularity, and under a determinate form, a particular name is given to them, as *Tetanus*, *Hysteria*, Epilepsy. But distinctions like these are of little value. It is with *convulsion* as with *fever*; both terms will disappear from nosology when the nature and seat of all diseases shall be ascertained. Between convulsion and spasm there is little difference, both being varieties of the same kind of action. The division

of convulsions into tonic and clonic, or into alternating and permanent, appears to the author to be of little use. Nevertheless, if it were possible to connect them with an alteration of the spinal chord, it might be asked if the former were not owing to an affection of one-half of the chord, while the latter depended on a simultaneous morbid action of both the anterior and posterior roots of the spinal nerves,—a supposition which appears to be justified by the experiments and observations of Bellingeri, though scarcely supported by the labours of Bell, Magendie, and Calmeil. All contractile organs may be affected with convulsions, though the muscles almost exclusively suffer. Those affecting the voluntary muscles, whether partial or general, have their origin in the brain or spinal chord; while those affecting organs not under cerebral control are evidently under the influence of the great sympathetic and its branches. M. Velpeau does not consider it possible, in the present state of medical science, to determine whether convulsions be sympathetic or idiopathic. If, from the *hyperæmia*, which most frequently accompanies or produces them, they were to be classed among irritations, the *anæmia* succeeding sudden and abundant hemorrhages, which is also a cause of convulsions, would naturally lead us to class them among asthenic diseases.

2. *Forms, Species, and Frequency.*—Every variety of form which convulsions may assume during pregnancy may also appear during labour and after delivery. The apoplectic form is rarer during pregnancy than during labour. The reverse is the case with the hysteric form. Partial convulsions are more frequent before and after than during labour; but the agitation and anguish of a woman during the most violent pains are often carried so far as to approach convulsive affections, and it is sometimes not easy at first to draw the distinction. In pregnant women, though liable to convulsions, both general and partial, the voluntary muscles only are most frequently affected; but in some cases the *viscera*, where nature has introduced a fleshy membrane, are equally attached. Levret speaks of a species of convulsion which affects only full muscles and the sphincters of those which are hollow. It is thus that the pharynx, œsophagus, stomach, intestines, bladder, and *uterus* itself, the heart, and, above all, the diaphragm, are sometimes violently convulsed,

M. Velpeau believes partial convulsions to be very rare, and that a great number of the cases on record ought to bear a different name. The obstinate vomiting which occurs in some pregnancies may, no doubt, be referred to convulsions of the stomach, in the same way as violent palpitations may be attributed to convulsions of the heart; but such affections are usually classified otherwise. Partial convulsions, like general convulsions, may be divided into tonic and clonic, the one fixed, and, as it were, tetanic; the other alternating, and accompanied by motions more or less extraordinary. It is thus that those convulsions begin which are accompanied by the sensation of a ball mounting from the hypogastrium to the throat, and which frequently occur during the first four months of gestation. These in general have their origin in the *uterus*, and by them we may explain many of those stories of women possessed by a demon, or devoured by an animal who had penetrated their viscera. In some cases the *parietes* of the *abdomen*, but more frequently the *viscera* alone, are affected. Smellie and Plenck assert, that they have observed convulsions of the *vagina* so strong as to prevent the child from being born; and MM. Halma-Grand and Mondiere say, that they have felt the *vagina* contract, so as to benumb the hand of the accoucheur during labour.

The partial convulsions, however, which demand most attention are those of the *uterus*, which occur during pregnancy, labour, and recovery. During gestation, according to M. Alphonse Menard, they cause the *uterus* to assume the form of a gourd. MM. C. Baudelocque and Deneux cite a case where the womb raised and lowered itself, and advanced to the right and to the left with surprising force. M. E. Petit narrates an instance in which they were so violent as to threaten at every moment to precipitate the *uterus* into the *vagina*, and it became necessary to support it with the fingers to prevent its being protruded. These facts, though perhaps somewhat exaggerated, are narrated on too good authority to permit us to doubt their truth. M. Pacoud has related a case of the womb's becoming the seat of real motion and violent agitation.

Convulsions of the *uterus* during labour are more easily comprehended, as at the period of expulsion each contraction is to a certain extent convulsive. Though they sometimes invade the whole organ, they are in general confined to one region. Those of the neck of the *uterus* have been especially noted, whether at the external or vaginal orifice, or the internal or uterine. Little faith, however, is to be placed in those narratives of cases where spasmodic contractions of the neck have taken place before the head has entered the hollow. It is almost always near the body of the *uterus*, and not on the side of the *vagina*, that cramp or convulsion occurs. In this sense it is met with only after the presenting part has passed, in proof of which M. Velpeau has cited cases from Mauriceau, Smellie, Dubois, and Menard.

Delivery does not protect against a like occurrence. The retention of the *placenta* in the hour-glass contraction (*chatonnement du placenta*,) is an effect of it. Cases of this are narrated by M. Gerard of Lyons, and M. A. Menard. Normal contractions occurred below the obstruction, but in the cyst they were accompanied by a trembling, easily perceived by the accoucheur, and presenting the true convulsive character. Several facts of the same kind have been met with by M. Velpeau himself.

There are various kinds of puerperal convulsions, which may be compared to other convulsive affections. Thus we have tetanic, cataleptic, hysteric, epileptic, apoplectic, &c. Merriman includes them under the title of epilepsy. Vogel calls them acute epilepsy; and Burns, who allows the existence of a species produced by exhaustion, fatigue, slowness of labour, and hemorrhage, says that the most common kinds are of the nature of *eclampsia* or *tetanus*, and that these are in the proportion of a hundred to one. Sauvages, wishing to make puerperal convulsions a distinct disease, gave them the name of *eclampsia*, which was afterwards adopted by Hamilton. Dewees classes them under three heads, the epileptic, apoplectic, and hysteric. Baudelocque arranges them under the titles of tetanus, epilepsy, and catalepsy. M. Velpeau believes, with Madame La Chapelle, that the convulsions of women during pregnancy, labour, and recovery, differ in general from catalepsy, epilepsy, apoplexy, *hysteria*, and *tetanus*, and, with Desormeaux, prefers the general name *eclampsia*, provided Young's term, *dystokia convulsiva*, be not thought better.

We pass over the author's remarks on several cases narrated by former authors, as instances of real *tetanus*, *extasis*, catalepsy, apoplexy, *hysteria*, &c. all of which he shows to be deficient in some respects of the characteristic marks of those diseases. We give briefly his remarks on the frequency of the disease. Merriman mentions 48 cases in 2000 labours, while Madame La Chapelle gives only 67 in 38,000, and of these 67, six were cases of apoplexy. Dr Ryan asserts that puerperal convulsions are more frequent in England than in France. This, however, is by no means established; for from the tables of M. Pacoud of Bourg, it appears that they were met with 47 times in 11,208 labours, while Mr Hart met with only 6 in 4000, so that this difference may be much less than one would infer from the reports of Dr Merriman and Madame La Chapelle. Gaitskell has cited only 1 case in 400, but M. Desjardins 7 in 1000. In 3000, M. Champion met with 10. To show of how little value conclusions drawn from such reports are, M. Velpeau mentions the fact, that neither at the hospital of the Faculty of Medicine nor at his own amphitheatre, did he meet with one case in a thousand labours, while he has seen several at the Lying-in Hospital of Tours, and at the Hospital St Louis, where his observations were less assiduously made. In private practice he has met with 16 in less than 1500 cases. It is probable that they may be more frequent in some seasons and in certain states of the atmosphere than in others. Smellie believed that he had established this; and M. Bouteilloux affirms, with Madame La Chapelle, that at the Lying-in Hospital of Paris they are sometimes almost epidemic, so that one patient is rarely seized without others being attacked also. They are, without doubt, most frequent during labour. It is not, however, either at the beginning or the end, but in the long interval between these periods, that they occur. M. Menard was wrong in affirming that they scarcely take place during pregnancy, except at the full time. It is more correct to say with Chaussier, that they occur chiefly during the last months of pregnancy, or with Madame La Chapelle, that they are rare before the sixth month. M. Velpeau has seen them at six months. At five months they are very rare; and, as Dr Burns observes, those which occur during the first four months come too near *hysteria* to cause any uneasiness. Nevertheless, M. Velpeau has given the particulars of a case reported to him by M. Larrey, of a young female who was seized with *trismus* at the fourth month, and died in a state of complete *opisthotonos*. The same occurred in a case mentioned by Willis. After delivery, they are much less frequent; and an old *interne* of the Lying-in Hospital told M. Velpeau that out of 30 cases of *eclampsia*, he had not met with one instance. This, however, might be mere accident, for *eclampsia* is not exactly rare after delivery. In illustration and corroboration of these remarks of M. Velpeau, we extract the following tables:

1. Mariceau.

During pregnancy, -	7	Died,	3
Do. labour, -	19	do.	11
After delivery, -	16	do.	5
During pregnancy & labour,	1	do.	1
During labour, and after delivery, -	2	do.	1
Total cases,	45	Died,	21

2. Merriman.

After delivery, -	6	Died,	1
During delivery, -	3	do.	1
During delivery by forceps,	11	do.	0
Do. by opening the head,	9	do.	2
Do. by turning, -	4	do.	2
Without being delivered,	1	do.	1
Delivered without assistance,	14	do.	5
Total cases,	48	Died,	12

Note.—In 36 the labour was the first; 36 were cured; 12 died; 17 children were born alive, and 12 dead.

3. Madame La Chapelle.

1.	No. of women delivered,	15,652	Cases of *Eclampsia*,	36	Apoplexy,	4
2.	Do. do.	22,243	Do. do.	25	Do.	2
	Total women delivered,	37,895	Tot. do. of *Eclampsia*,	61	Of apoplexy,	6

In the first set of cases the forceps were used twelve times, and turning was practised five times.

In the second set of cases the forceps were used eight times.

4. M. Pacoud.

	Women delivered,	before deliv.	during lab.	after lab.	Tot.
1823,	2341	0	2	0	2
1824,	1615	7	0	0	7
1825,	1710	1	5	2	8
1826,	2341	6	7	3	16
1827,	3201	4	6	4	14
	11,208	18	20	9	47

5. M. Desjardins.

During lab. 5 after deliv. 2 total, 7
All cured.

6. M. Champion.

Cured, 7 died, 3 total, 10
Five of the children were saved. All were first deliveries.

7. M. Velpeau.

		died,	cured,
During pregnancy,	7	2	5
During labour,	5	2	3
After delivery,	9	4	5
	21	8	13

3. *Causes of Eclampsia.*—M. Velpeau divides these into predisposing and determining. Although *eclampsia* is found in all seasons, at every age, and in all classes of society, it would appear that strong plethoric individuals who have a dry fibre, a very animated countenance, and a short neck, who are abundantly and frequently regular, nervous, delicate, irritable, and subject to nervous complaints, who are young and pregnant for the first time, are more exposed to the disease than others. According to Merriman, puerperal convulsions depend on general irritability, distension of the *uterus*, and overloading of the system. Though occurring most frequently in women who are pregnant for the first time, M. Velpeau has collected numerous facts which prove that *eclampsia* may take place in the second, third, fourth, and even fifth pregnancy, not only in women who were attacked in their first, but in others who had previously escaped; and M. Dumont mentions one patient who was not attacked till her eleventh pregnancy. A deranged state of the stomach and intestines has been found to favour the developement of convulsions,—an opinion which is strongly inculcated by Burns, Chaussier, and others. M. Velpeau, however, does not believe this to be a common cause. Infiltration, especially of the lower extremities, is a cause which demands attention. Though this has been called in question, M. Velpeau believes that a careful examination of facts will show it to be the case. Besides these general predisposing causes, there are other special ones which occur at different periods. During pregnancy these are the effect of conception on the nervous system,—the

suppression of the *menses*,—the increased vascularity and irritability of the *uterus*,—its increased size pressing on the great vascular and nervous trunks of the pelvis,—pressure on the neck of the bladder,—the sympathy of the stomach with the *uterus*, and mechanical pressure on the stomach, diaphragm, lungs, and even heart. In labour *eclampsia* is favoured by the extreme distension of the *uterus*,—by the difficulty which the fluids experience in traversing this organ,—by the rigidity, hardness, or the spasmodic contraction of its neck, and the excessive sensibility of all its substance,—by unusual hardness of the membranes, and superabundance of the waters,—the presence of two fœtuses,—the malposition of the infant,—all the mechanical circumstances which may prevent or retard delivery,—and, above all, the excitement caused by the preparative and first expulsive pains. M. Velpeau is of opinion, that, at this period, it is neither by pressure on the nerves, nor by a determination of the fluids to the head, that the patient is exposed to convulsions, but by the changes which have been effected in the functions of the *uterus*. He conceives, in opposition to the notion of Dewees and Power, that uterine contractions are painful, and that the pain is essentially in the *uterus*, and not, as Leroux thinks, in the nerves of the pelvis, or, as Gerard supposes, in the neighbouring parts. But such a state of matters cannot exist without disturbing the vascular, and above all, the nervous system.

Without going the length of M. Dubois, who considers those contractions physiological, which are necessary for the expulsion of the fœtus in ordinary time, and those pathological, which replace them in tedious labours, M. Velpeau admits, that the pains which return after a long interval produce more pain and irritation than the first; and, though he does not entertain Chaussier's opinion, that the pains of labour are situate principally in the neck of the *uterus*, he is disposed to believe, that the more resistance this part offers to puerperal contractions, the more the patient is exposed to convulsions. Hence it occurs so much more frequently in females pregnant for the first time, and those who become mothers at an advanced age. After delivery, the rapid depletion of the abdomen changes suddenly the relations of all its organs. The blood, which had circulated with such rapidity through the inferior aortic system, is poured in great abundance through the vessels, and thus the brain and spinal chord, which had been previously excited by the quantity of blood forced upon them during pregnancy and labour, are suddenly deprived of their stimulus. Besides, the work of the *uterus* is not completed with the expulsion of the *ovum*. A part of the fluids combined with its substance enters the circulation in a state more or less altered, the *uterus*, which is more irritable, and in a state more approaching to disease than during its distension, does not contract with the same impunity, and, after the derangement produced by gestation and labour, the equilibrium, which there is a natural tendency to restore, cannot be re-established without disturbing again the nervous powers.

In treating of the determining causes, M. Velpeau takes occasion to point out that many which are enumerated by authors, such as impure air, high temperature, affections of the mind, and want of sleep, have by no means always the effect of producing convulsions, and that the opinion of La Motte and M. C. Baudelocque, that they occur more frequently in the case of a male fœtus, is untenable. During pregnancy all the causes of abortion, the position of the placenta over the mouth of the *uterus* and the menstrual *molimen*, which is proved to occur in some females, may produce convulsions. During labour *eclampsia* may be determined by various causes, such as the presence of a calculus in the bladder, or a tumour in the hollow of the pelvis, by polypus or cancer of the womb, by occlusion or abnormal contraction of the neck, by the continuation of the *hymen*, agglutination of the *vulva*, obliteration of the vagina, by the disproportionate volume or malposition of the fœtus, and by all tocological operations, by the death of the infant, by rupture of the *uterus* or its neck. In a patient of M. Dunaud, a fibro-cartilaginous crescent at the top of the *vagina* produced *eclampsia*. After delivery, convulsions may arise from the lochia being too abundant, from total or partial inversion of the *uterus*, from too rapid delivery, and, above all, from retention of the placenta, or any part of it. M. Bouteilloux agrees with La Motte in believing, that the presence of any foreign body in the *uterus* is the most common cause of convulsions after delivery. Without denying that *metritis* may sometimes produce *eclampsia*, M. Velpeau has no hesitation in saying, that it is not the common cause, either during pregnancy, labour, or recovery. *Metritis* comes on with symptoms different from those which in many cases attend *eclampsia*. When a woman in excellent health is suddenly seized with convulsions, it is difficult to believe in a previous inflammation of the womb,—an indispensable condition, according to Krimer, whose six cases, however, on which he founds his doctrine, ought to be reckoned nothing more than mere coincidences.

4. *Symptoms and Progress.*—*Eclampsia* is sometimes preceded by premonitory symptoms, such as blasts of heat about the head,confusion of ideas, hallucinations, difficulty of moving, an air of stupidity, a frightened look, redness of the conjunctiva or of the whole face, a certain degree of swelling of the neck or face, vertigo, irregularity of the pulse, slight convulsive move-

ments of the muscles, *subsultus tendinum*, &c. Violent headach is the premonitory symptom most frequently observed. Denman and others attach much importance to pain in the stomach,—the convulsions following which, are said to be more severe than those preceded by pain in the head. Though M. Velpeau has remarked the presence of those symptoms in several cases, he has found them wanting in the greatest number. It is strange that Chaussier and Madame La Chapelle, whose observations were made in the same establishment, have come to opposite conclusions on the frequency of premonitory symptoms in *eclampsia*,—the former asserting that they almost always exist, the latter, that they are often wanting. Some suffer from a sense of weight, hardness, or pain in the *hypogastrium* for weeks, days, or hours, before the disease makes its appearance. These symptoms, which he thinks have not been sufficiently attended to, M. Velpeau has met with in three different cases. In these circumstances, if the hand be placed over the *uterus*, a sort of tonic contraction will be felt, tight and easily perceived. Farther, the premonitory symptoms of *eclampsia* are connected with the three principal species of predisposing causes. If the female is under the influence of one of those states which precede the pultaceous softening of the brain described by Rostan, or the inflammatory softening of Lallemand, or the apoplectic disorder of Rochoux, the approach of convulsions will be announced by some derangement about the head; if there be stoppage, overloading, or irritation of the digestive organs, they will be preceded by *anorexia*, *borborygmi*, or pains in the epigastrium; and if the *uterus* itself be in a state of disease or irritation, *hysterical* symptoms will usher in the disease, which will appear to proceed from the *pelvis* or *hypogastrium*.

Frequently, however, there are no premonitory symptoms; and the patient falls suddenly insensible, and appears to be roused for an instant, only to be more violently agitated; the limbs are twisted, contracted, flexed, and extended with astonishing force and rapidity; the trunk is thrown backwards, so as to cause the *occiput* to approach the heels, which actually occurred in one instance mentioned by Baudelocque; the hands are carried to the chest or *epigastrium*, which the patient beats or tears with rage; the countenance is convulsed; the eyes are rolled about and turned backwards into the orbit, from which they seem ready to start. The beatings of the carotid and temporal arteries are seen through the skin; the jugular veins are distended; the face and neck are swollen, and almost purple. The mouth is filled with frothy water, which is sometimes darted to a distance; the tongue is irregularly agitated; the diaphragm, by its hasty contractions, produces sighing, threatens suffocation, and drives from the mouth and nose the matters accumulated there. The stomach, intestines, bladder, and *uterus*, when affected, expel with rapidity their contents. Sometimes all the *viscera* participate in the irregular motions of the limbs, while at others the face and rest of the body pass from this state of agitation and vivid colour to the most absolute tranquillity, and a mortal paleness. At last cerebral congestion ensues, which produces *coma*. The duration of the fit is as variable as its intensity, varying from five minutes to an hour. Sense may not return for half a day, or even twenty-four hours; and, if *coma* do not supervene, it may be several days, and yet the patient may be restored to perfect health. Most frequently there are many fits, the approach of a new one, according to Croft and Merriman, being indicated by a very decided slowness of pulse, a remarkable phenomenon of the existence of which M. Velpeau has satisfied himself. This is soon followed by rapid opening and shutting of the eyelids, and repeated movements of the lower jaw, injection of the countenance, flexion and extension of the head, and contortion of the limbs, followed by a state of torpor, generally of longer duration than the first, which either disappears altogether, or is followed by a new fit. This fit sometimes assumes all the appearance of apoplexy, and produces death. Some of the functions frequently remain impaired after the disease has disappeared, and sometimes it leaves behind it lacerations and effusions highly prejudicial to the organization. At 380th page of ninth volume of the Edinburgh Medical Commentaries, a case will be found reported by Mr Fynney, where the lower jaw was dislocated by convulsions, which came on during labour. When the patient returns to herself she feels fatigued and dejected, as if her limbs had been bruised by long and violent exercise. Astonished at the state in which she finds herself, she is ignorant of all that has passed, and can with difficulty believe what is told her. There are instances even of delivery having taken place without the patient's being aware of the fact, and where they could with difficulty afterwards comprehend that it had really occurred. Contusions and pain gradually appear in all the parts injured by the exertions. Such are the symptoms which manifest themselves in *eclampsia*. It is scarcely necessary to mention, that all are not found in every case. They are modified according to the variety of the disease with which the patient is attacked. Into these varieties, however, which M. Velpeau has accurately described under the titles, *hysterical, tetanic, epileptic, and apoplectic*, our limits do not permit us to enter.

5. *Terminations and Prognosis.*—*Eclampsia* is said to ter-

minate in three ways, in recovery, death, or the production of another disease. When recovery supervenes, the intervals between the fits become longer and longer; or, if the fits come on more frequently, they are of shorter duration; the drowsiness, torpor, and coma are dissipated by degrees, and the patient seems to awake out of a long dream. If the disease should proceed to a fatal termination, the fits become more intense and of longer duration, the head is more and more embarrassed, *coma* supervenes, and death ensues after a longer or shorter period. Denman mentions an instance where the patient died in thirty-five minutes; M. Schedel's patient did not survive twelve hours; Dr Hamilton's was seized at nine P. M. and did not survive till ten next morning, though she was only in the eighth month of her pregnancy; Chaussier has seen one perish in twenty-one hours; one of Dewees' survived only a few hours; Dr Shaw's died in thirty-four hours, though she lost eighty-two ounces of blood; but in this case it is probable that effusion in the brain took place. Convulsions sometimes produce rupture of the *uterus*, and it is probable that most of the partial lacerations of this organ are owing to them. This, of course, can take place only during pregnancy, while the apoplectic termination occurs very frequently after delivery. Such, no doubt, was the mode in which death took place in the case mentioned by M. Baudelocque, where the patient, who had been delivered six weeks previously, was seized with convulsions in the evening and died during the night. According to M. Velpeau, *eclampsia* terminates less frequently in a fatal manner after than before delivery, though Astruc and Tissot have asserted the contrary. Of the diseases said to be the result of *eclampsia*, cerebral hemorrhage is the most formidable, though scarcely more so than those lesions producing *mania*, softening of the brain, and different kinds of palsy. Madame La Chapelle asserts, that many women affected with puerperal convulsions die of *peritonitis*,—a statement which is corroborated by a case published by M. Ciniselli. In some cases inflammatory affections may ensue from the treatment adopted. M. Velpeau saw a patient who, on the second day of her convalescence, was seized with a violent attack of *erysipelas*, affecting the whole leg, in consequence of the application of sinapisms, which at first had produced no effect. Desormeaux mentions a case where the skin did not begin to get red till the third day after the rubefacient cataplasms had been withdrawn. M. Velpeau suggests that the same may take place in the mucous membranes lining the interior, which, though scarcely irritated during the fit by the medicines exhibited, may, when the violence of the disease is abated, become the seat of inflammatory action.

The *prognosis* is in general unfavourable, both as respects the mother and the child. The chief midwife of the Lying-in Hospital believes that, even under the best treatment, one-half of the mothers die. Lowder and Hunter say more than a-half; Dubois believes it to be more dangerous than hemorrhage; Parr that six or seven perish out of ten; Jacob asserts that they all die; and Ryan that a third. *Eclampsia* is less severe during labour than before, and the further the labour is advanced the more favourable is the *prognosis*, as nothing contributes so much to a favourable issue as the emptying of the *uterus*. If the neck of the *uterus* and head of the child be so disposed as to render it easy to extract the infant, the disease will be less troublesome than if the neck were hard and not obliterated. It is in consequence of this last mentioned state that the disease is so severe during the latter months of pregnancy. Still, however, even in these circumstances, some patients recover, and bear their children at full time, of which instances are given by MM. Gasc and Landre-Beauvais and Ciniselli. Ciniselli's patient died; but the child survived. If the patient can go to the regular time, it is possible, as Levret and Lauverjat have remarked, and as M. Velpeau has seen, for her to enter freely into labour and all accidents to disappear. During labour, *eclampsia* sometimes terminates in rapid expulsion of the child. When convulsions appear in hysterical, epileptic, or nervous females, when they partake of any of these affections, when the fits are short and separated by well-marked intervals of calmness and restoration of all the functions, they are less to be dreaded than those which have no analogy with the previous state of the nervous system, or which attack plethoric individuals. These convulsions, which are accompanied by apoplectic symptoms, *coma*, stertorous breathing, or entire loss of sense in the intervals between the fits, as well as those which are symptomatic of some organic disease, aggravated by pregnancy, are extremely dangerous. The infant is in greater danger than the mother. In abortion it cannot survive, and in premature labour it generally perishes. M. Velpeau does not believe that severe convulsions of the mother almost always destroy the child, or that one or two fits are sufficient for this purpose. The numerous deaths of the children proceed from the impossibility in many cases of delivering the mother till long after the appearance of the disease. If the delivery be prompt the child can be saved; if otherwise, it dies, but not, as M. Baudelocque supposes, in consequence of the efforts made to extract the child.

6. *Post mortem appearances.*—Pathological anatomy is far from giving any satisfactory explanation of the severity of the symptoms. M. Velpeau has collected from every source all the

light which has been thrown on the subject. Merriman found a small quantity of *serum* in the ventricles of the brain, the veins and sinuses more or less engorged, the *meninges* and cerebral substance a little reddened, or in a natural state, sometimes evident traces of congestion, or a slight effusion of blood, but more frequently no appreciable lesion. The lesions exhibited by the other splanchnic cavities were no less variable. The chief alterations found by Denman were flabbiness and almost emptiness of the heart, hepatization, or paleness of the lungs, and some ounces of a yellowish or reddish serum in the serous membranes. After delivery, however, he found some traces of inflammation in the abdomen. Hewson, Hooper, and Ley have each met with a case in which considerable effusion into the ventricles of the brain had taken place. M. Bouteilloux, who gives a report of many dissections, never met with any manifest alterations. M. Cruveilhier, in one case, found the vessels not even engorged. Madame La Chapelle holds the same language, and formally announces that, except where apoplexy is conjoined with the disease, the organic lesions are not at all in proportion to the intensity of the symptoms. A little *serum* in the ventricles, and a doubtful engorgement of the blood-vessels, are what she has most frequently met with. In her second case, *serum* was effused into the ventricles, the *pleura* and *pericardium* at the same time. But this may be considered as the effect rather than the cause of the disease. Baudelocque and Ciniselli are of the same opinion. Several cases, however, are on record where sanguineous effusion was found in the brain. Of this M. Velpeau gives several instances. The alteration of the *dura mater* mentioned by Baudelocque, of which he has given only one case, merits little attention. The spinal chord has not been examined often enough to inform us whether it may not accidentally be the seat of the evil, as Mr Powel supposes, who believes the disease to consist in the transference of action from the womb to the nervous centres; or as Dr Burns believes, who thinks that the irritation is transmitted from the *uterus* to the spinal chord by the hypogastric nerves. The trifling lesions, remarked by authors in the thoracic and abdominal cavities, are too insignificant to merit examination; and the opinion of Autenrieth and Rimer, that convulsions depend upon *metritis*, cannot stand a moment's examination. Thus pathological anatomy throws little or no light on the nature of *eclampsia*.

7. *Treatment.*—M. Velpeau reviews at great length the various plans of treatment, both British and continental, and concludes with a summary of his opinions, which we shall lay at considerable length before the reader.

Ether, mint water, orange flower water, and other stimulants or carminatives of the same nature, are not to be neglected in those cases in which the convulsions resemble *hysteria* or epilepsy more than apoplexy, especially if the patient be nervous, very excitable, or of a lymphatic temperament. In the same cases, syrup of poppies, the extract or tincture of opium, may also be given, either alone or combined with the preparations just mentioned. Camphor, so much extolled by Dr Hamilton, though thought of little consequence by Dr Burns, may also be advantageously tried. When the patient cannot swallow, these medicines may be administered by the *rectum*. In cases where rigidity, or scirrhous hardening, or spasmodic contraction of the neck of the *uterus* appears to be the only or principal cause of the convulsions, if blood-letting should prove insufficient, opiate cerate, or, what is better, *belladonna* ointment, may be applied to the part.

Immersion in the tepid bath calms irritation, and may be used when apoplectic symptoms do not appear. Blood-letting ought always to be premised if the patient can bear it; but neither it nor the bath ought to be employed when the convulsions depend on loss of blood, or on serous plethora, or when there is a threatening of torpor. The time during which the patient may remain in the bath will depend on the relief which she experiences; it may vary from half an hour or less to an hour or more. It will be advantageous also to draw asunder the *vulva*, and allow the water to penetrate the *vagina*, as recommended by Lauverjat.

Sponging of the head, or the application of iced water to it, either alone, or while the rest of the body is in the hot bath, is useful, provided there be no fear of violent cerebral reaction. External derivatives, such as sinapisms to the feet, legs, or thighs, a large blister to the nape of the neck, dry friction along the spine and limbs, may also be tried.

M. Velpeau acknowledges, that while by the English mode of treatment, viz. calomel, followed by a solution of neutral salts exhibited by the mouth or *rectum*, together with the application of the *Aqua Acetatis Ammoniæ*, or spirit of rosemary, to the head, Dr Merriman lost only eleven out of forty-eight patients, Madame La Chapelle, by the most vigorous treatment, was able to save only one-half. Moxa and cupping are not preferable to leeches or the ordinary derivatives. General bleeding is indispensable in all cases, whether slight or severe, where the patient is young, strong, of good constitution, and not weakened by previous labours. Local bleeding can alone be safe in opposite cases.

After delivery, when the *lochia* are suppressed, leeches may be placed in the greater *labia*, or at the verge of the *anus*. In other cases they are to be placed behind the ears. When the vascular system has been depleted, if the state of the patient permit, a bath is to be prescribed. After hemorrhage or a fatiguing labour, some slight stimulant may be prescribed in small quantities. In severe cases the various derivatives are useful as adjuncts to general bleeding, or as a substitute for it when it cannot be safely employed. Before the sixth month, the disease ought to be subdued, if possible, without emptying the *uterus*, but after that period, the *fœtus* being visible, there is less need of precaution in this respect. In fine, if all means but delivery have been tried without effect, and forced delivery be the only means of saving the mother and child, and if the mouth of the *uterus*, though rendered thin, be hard and undilatable, and forcibly resist the uterine contractions, Bodin's practice is to be followed, and one or two incisions made in such a way as to relax the parts sufficiently.

To this practice we are decidedly adverse; and we conceive that the plan proposed and adopted by Ashwell, Ryan, &c. of attempting to dilate the *uterus* with the fingers, is far preferable, as it gives both the mother and the child a better chance. We shudder at the thought of countenancing for a moment a mode of procedure which gives to rashness, impatience, and ignorance, a new pretext for adding to the present long catalogue of scientific contrivances of torturing parturient women. We must express our scepticism, too, of any good that can be derived from the application of the opiate or *belladonna* cerate, so much lauded by our neighbours, which, in our opinion, is merely losing time. If bleeding do not succeed in overcoming the rigidity of the *os uteri*, we know of nothing else to which in convulsions we could trust.

M. Velpeau concludes with some directions for the management of the patient during the fits. He justly reprobates any attempt to control the motions of the patient, farther than what is necessary to prevent her from injuring herself. The introduction of a spoon or other metallic plate, or the gag recommended by Madame Boivin, he disapproves of, and thinks, with Madame La Chapelle, that it is better to push back the tongue whenever it was protruded. The insertion, however, of a small bit of cork between the teeth, as recommended by Gardien, is a resource which may be employed. Where the urine is not evacuated, the catheter ought to be introduced twice a-day.

We have now given a pretty full account of M. Velpeau's Thesis, which is valuable, as being the best digest of the opinions of different writers, both in this country and the Continent, on the convulsions of parturient females, with which we are acquainted. In criticising the various opinions, M. Velpeau is always candid and impartial; and we find none of that undue preference for the writings of his countrymen, and overweening contempt for all others, which is too often met with among secondary writers in all countries. In these circumstances, we have no hesitation in recommending it to the careful perusal of our readers.

ART. IV.—*Nouveau Systeme de Chimie Organique, fondé sur des Methodes Nouvelles d'Observations;* par F. V. RASPAIL. Accompagné de Douze Planches Gravées, dont six coloriées. Paris, Chez J. B. Bailliere. 1833. 8vo. Pp. 576.

A New System of Organic Chemistry. Translated from the French of F. V. RASPAIL; *With Notes and Additions*, by WILLIAM HENDERSON, M. D. Lecturer on Materia Medica in the University of Aberdeen. London, Edin., &c. 1834. 8vo. Pp. 602.

THE announcement of novelty in any system is not always a very safe measure; for if the performance do not completely accord with the expectations thus excited, the disappointment which ensues, may be so great as to make the reader overlook the actual merits of the system thus introduced. This caution is by no means unnecessary in the case of the treatise of M. Raspail; because, though the system is not altogether new, and, indeed, no system of organic chemistry could, at the present moment, with justice claim that title, the views unfolded on the constitution of organic textures and productions are in many instances so original, and the mode in which M. Raspail applies the facts afforded by different sciences is so ingenious, that the work ought to be perused by all who wish to obtain just and comprehensive ideas on the chemical constitution and relations of organized bodies.

M. Raspail, however, is mistaken in imagining that his system is altogether new, either in the method of investigation, or in the application of the results. Not only has he been preceded in the application of the microscope, and various other auxiliaries and contrivances, to the solution of the difficulties, and the elucidation of the mysteries of organic chemistry by Young, Wollaston, Brewster, and others; but by the latter two philosophers he will find that several very happy applications of the facts thus furnished, have been given in explaining the structure of several organic substances. We must do M. Raspail, however, the justice to say, that he is the first who has undertaken to apply these methods of inquiry upon an extensive scale, and the first who has produced, from the facts thus furnished, a complete system of organic chemistry, upon the principles now specified. It is in this manner that his work partakes of the imperfections of every new and original undertaking. With bold, novel, and often very ingenious views and methods of generalization, we occasionally see uncertain and doubtful facts pressed into the service in support of particular opinions; in others, well ascertained facts, or at least facts which we had been taught to believe to be well ascertained, questioned, denied, and discarded, because they are at variance with the principles of the author; and in other instances, both the facts and the principles of other philosophers are treated with a degree of ironical commendation, sarcastic criticism, or flippant disrespect, which is scarcely justified even on the assumption that they were entirely void of foundation.

M. Raspail commences his work with an Introductory Sketch, in which he explains, in a series of preliminary observations, his ideas on the characters of the organized world, and on the application of chemistry to elucidate its peculiar constitution. He maintains, that there is no known line of demarcation between plants and animals; and if we mentally distinguish these two great divisions of the living and organized world, it is only by contemplating those objects and classes of objects in each, which are farthest removed from the point in which their characters become common to both; and it is only, he informs us, in reference to these that the terms *Vegetable Anatomy* and *Animal Anatomy*, *Vegetable Physiology* and *Animal Physiology*, *Botany* and *Zoology*, can be with consistence adopted; and hence, he argues, each of these sciences more or less completely disappoints the expectations created by its definition.

Physiology, however, is, above all, he maintains, the most deceitful science in this respect. After interrogating libraries of volumes on the mystery of the vital principles which is concealed in a single particle of matter, and refusing to decide on the nature of any organ with the evidence afforded by the knife of the anatomist, she has given nothing to science but a mass of individual facts without connection, method, or mutual explanation.

Chemistry is next dragged before the tribunal of this inexorable judge; and after being accused of all sorts of mummery and laborious trifling,—of triturating, bruising, macerating, boiling, and dissolving every thing indiscriminately,—she is told, that all that she has hitherto done is to present false inductions, inaccurate methods of research, vague and confused results, and, in short, the most unsatisfactory assemblage of confused, heterogeneous, and incongruous facts.

The original source of all this confusion M. Raspail represents to be, that the physical sciences, the object of which is to investigate the structure, properties, and constitution of organic bodies, are cultivated too much apart, and with too little mutual aid and connection. The chemist, he says, despises the anatomist, the botanist, and the zoologist; the physiologist holds the chemist in equal contempt; and the result is, that organic chemistry, instead of furnishing just and trustworthy information, has given merely isolated facts and distorted relations, which bear no resemblance to the truth.

All this is no doubt extremely fine. But it is, to say the least of it, gross exaggeration. It is, in short, a degree of high colouring and extravagant painting for the purpose of introducing, with good and sufficient reason, the method of the author. M. Raspail explains the principle of his method with such peculiar felicity, that we think it would be impossible to do it justice without giving it in his own words; and beg to submit the following passage as a beautiful illustration of the truth of the observation, that true genius is always associated with the greatest modesty.

"Now this new method may be summed up in these terms:—To borrow from each science all that may be useful for ascertaining a fact, or establishing a law; for, although a book may very properly be special, being a collection of a certain order of facts, an observer who confines himself within the circle of a specialty, is either incapable or inconsequent.

"Certain substances being by natural processes deposited within certain organs, I shall appeal to anatomy for the means of recognizing these organs; and, when once I have learned to distinguish them, I shall apply to chemistry for the information which its reactions and its processes can furnish. If these organs are too small to be seen by the eye simply, I shall employ the assistance of the magnifying glasses of the microscope. Physical science will teach me to follow the course of the luminous rays, and will give me a knowledge of the effects of refracted and reflected light; and I shall establish a chemical laboratory on the object-holder of the microscope.

"Instead, then, of confounding heterogeneous organs under the pestle,—instead of amusing myself by reducing symmetry to chaos, that I vainly try again to elicit order from it,—I shall study each organ by itself, and examine its contents in a state of the greatest purity; and when I have satisfied myself fully as to their characters and actions, I shall have no difficulty in distinguishing them when disguised by mixtures. I shall throw chains over this Proteus at the instant when he slumbers; by my perseverance and imperturbable determination, I shall force him to reveal to me his mysteries; and then it will be in vain that he assumes, in turn, the forms of a cedar, a dragon, a river, a tiger, a lion; he shall not escape the eye which has found him out and subdued him.

"This simple and rational idea I have unceasingly pursued and applied during several years; and such is the power of a correct conception, that, without a laboratory, without instruments, without patronage, and often without resources, it has not failed, in my hands, to be prolific in results which, after much persecution and opposition, are at last coming to be every where adopted.

" The book which I now publish is an extensive application of it. I might have made it more voluminous; but, as I should have devoted the surplus only to the refutation of a number of supposed discoveries, and as every one will find, in what it contains, principles sufficient to enable him to refute them for himself, I think that the reader will be satisfied with my rigid conciseness. From the time that I devoted myself to the study of nature, I have been more and more convinced, that, in all the sciences, there is more need for clearing away rubbish than for accumulating new matter, —more necessity to pull down than to build up,—that we cannot now pretend to the honour of enriching science, except by reducing its scope,—in fine, that it scarcely ought to advance now but by retreating. It is painful to make this avowal, but it is really true."

The author then proceeds to explain the method of investigation by which he proposes to achieve all these wonders; and this consists principally in observing, by a simple mounted magnifying lens, with or without the aid of diaphragms, reflecting mirrors, after dissection, the separate constituent elements of each object, in measuring their visual diameter and size by means of micrometers, in measuring their angles by means of a goniometer, in distinguishing their true colours, and thus obtaining the body or bodies in the greatest degree of simplicity and purity. When this part of the process is accomplished, then come the proper chemical analysis and decomposition by means of heat or reagents.

But, even in this department of observation, M. Raspail rejects with contempt the refined aids of modern optical instruments, and as matters of infinitely less indifference than is represented, and as utterly inadequate to the object proposed.

" Most modern micrographers," he says, " addressing themselves to the public, whose suffrages they court, or to judges, whose favours they solicit,—both equally incapable of appreciating the merit of the observations, find no better mode of establishing the value of their facts, than the cost of the microscopes with which they had made them. We observed this with the beautiful microscope of Adams, with the excellent microscope of Selligue, with the incomparable microscope of Amici they state at the beginning of their Memoirs, and challenge the world at large upon the incontestible discovery obtained by these powerful instruments. These pompous announcements are a compound of charlatanism and simplicity; these authors adopted the language used by their predecessors, as the passport of custom to the crown awarded to them by credulity. At this conjuncture I appeared with observations made by a rude apparatus of a single lens, value two francs, suspended in a copper frame fixed in a wooden block; and I had the audacity to attack the valuable observations of wealthy philosophers. The contest was desperate, as might be expected, when unprotected poverty ventured to knock at the gates of the sanctuary in which science was enshrined by fortune. The particulars of the dispute may be read in two essays quoted below.* The principles which I then established having been since generally admitted, it will be sufficient to state them generally."—P. 44.

M. Raspail, however, does not discard entirely the aids of chemical manipulation; and he then explains the adaptation of the ordinary means of analysis to the contrivances peculiar to his own method.

The genuine test of the value of every method of research, however, is to be found in the actual value and number of new or precise facts thus ascertained. We must, therefore, now inquire, whether M. Raspail has really good reason to speak in the confident tone which he assumes?

Beginning with an account of the theory on which his work is founded, he first explains what he denominates the chemical theory of organization,—in which he informs us that the type of organized being may be reduced, in its simplest expression, to an imperforated vesicle, possessing the property of elaborating for its own nourishment, to an indefinite extent, the gaseous or liquid substances received by *aspiration*, and throwing off by *expiration* such elements as are incapable of being assimilated. This vesicle, he further thinks, consists of coats formed by other vesicles mutually agglutinated, which may also be supposed to consist of similar small vesicles, and so full *ad infinitum*. Would this fancy admit of demonstration, or is it to be classed among the unfounded representations which the author, a few pages before, discovers in such profusion in the labours of other chemists?

This organized vesicle, he further tells us, consists of nothing but an intimate combination of water with carbon and certain salts, either earthy or ammoniacal. Now, in the same way, he proceeds, as from the real and visible of crystals we trace by analogy the ideal form of the chemical atom, which constitutes them, so also, by the same mental operation, we can conclude, that the combination of water, carbon, and a base, forms an organic atom which crystallizes in the form of a vesicle, whose properties differ from those which we observe in all the combinations of inorganic bodies crystallizing in angular forms.

He then proceeds to show that the whole business of organi-

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* Observations on the Granules which issue from the Pollen.—Mem. de la Soc. d'Hist. Nat. de Paris, iv. 1828. Ann. des Sciences d'Observat. i. 233. 1829.

To face p. 445.

TABULAR VIEW OF THE NEW SYSTEM OF ORGANIC CHEMISTRY.

- **FOURTH ORDER.**—*Organic Substances,*
  - *Animal Substances,*
    - *Products of Organization,*
      - III. Acids.
      - I. Silk.
      - II. Colouring matters.
      - III. Odorous do.
    - *Products of Disorganization,*
      - *of the Living Textures,*
        - Regular,
          - Animal mucus.
          - Serous secretions.
          - Sweat.
          - Urine.
        - Irregular,
          - Pus.
          - The itch.
      - *of the Textures by the action of Heat,*
      - *of the Textures when deprivid of Life,*
    - *Artificial Products,*
      - *of Ebullition,*
        - Osmazome.
        - Gelatin.
      - *of Disorganizing actions,*
        - Hydrocyanic acid.
        - Cyanogen.

- **SECOND CLASS.**—**EARTHY AND SALINE BASES OF THE TEXTURES.**
  - *Incrusted on the surface of the Textures,*
    - Crystallized silex.
    - ———— phosph. of lime.
    - ———— oxalate of lime.
    - Urinary and biliary calculi.
    - Petrifactions.
  - *Combined with the Elements of the Textures.*
  - *Dissolved in the Liquids of the Textures.*
  - *Obtained by Carbonizing or Incinerating the Textures.*

zation consists in converting oxygen, hydrogen, and carbon into another substance, which is arranged or crystallized, as he expresses it, in the vesicular form, and that the law of vitality consists in the faculty of alternate ***imbibition*** and ***transudation*** or ***exudation***, for which he blames Dutrochet much for substituting the terms *endosmosis* and *exosmosis*.

He next proceeds to consider the method of arranging the subjects of organic chemistry; and after a short and hasty review of the classifications of Thenard, Depretz, and Berzelius, in which he censures the two former, and faintly praises the latter as the best of a bad article, he unfolds the principles according to which he classifies and distinguishes the various objects coming under the head of organic chemistry. They may be stated briefly in the following manner.

All bodies or objects, whose forms and actions become the subject of physiological inquiry, may be distinguished according to the states, which they progressively assume, into organized substances, substances tending to become organized, substances undergoing organization, and organic substances. Each of these orders of substances are distinguished into vegetable and animal, according as they pertain to the one or other division of the organic world; and these two orders of organic substances, viz. the vegetable and animal, are again subdivided, according as they are products of organization, products of disorganization, or artificial products. The individual details of this mode of distinction and classification are exhibited in the subjoined table.

M. Raspail forthwith proceeds to consider the chemical history of the several substances of this table in methodical order, beginning with the vegetable substances of the first order of the first class. It is incompatible with the limits within which these observations must be confined, to follow his steps in the minute and critical survey which he makes of the various subjects brought under consideration. We merely propose to advert to a few of the topics considered in various parts, as a specimen of the method of investigation and reasoning adopted by M. Raspail.

The natural, botanical, and chemical history of Starch is communicated at great length, and with much minuteness and accuracy; and, after the author has given a sort of general view of the substance, he considers the characters which it presents in the various vegetable bodies in which it occurs. In the course of this review, he enters into an elaborate refutation of the received theory of the characters and combinations of starch. He maintains, for instance, that iodine does not form with that substance an *ioduret* of starch, in the proper acceptation of that term; that it merely colours it by being applied to the surface of each granule by the same mechanism, by means of which it communicates a yellow tint to the other organic tissues, as flax, cotton, wool, &c.; and that this coloration depends on the action of iodine, not on the starch granule, but on its perisperm or integument. Amidine, and the woody amylaceous matter obtained by Saussure, he regards as the result of analysis.

The ligneous structure he represents to be, according to microscopical observation, composed of an aggregate of cells or vessels, which formed the basis and skeleton of the living organs of the vegetable. These cells, by mutual pressure, present by their interstices a net-work with pentagonal or hexagonal meshes, not dissimilar to the delineations which the author gives of the adipose tissue,—or they may form cells with quadrilateral surfaces, or long tubes, more or less flattened and contorted by desiccation, and various in length. The author then describes the several varieties of the woody tissue, and the developement of the leaf and of the trunk; but so minutely, that it is impracticable to give an abstract of the process which he represents to take place. It will be more appropriate, in this place, to adduce some of the practical conclusions at which he arrives, as more interesting and intelligible to the generality of readers. Not an improper example of this kind may be found in the following observations on what are very absurdly denominated the *Effects of Time on the Woody Textures.*

"180. The nature of this work does not admit of my dwelling on the effect of time on the living vegetable, which we know is infinitely variable in its energy on the different kinds of vegetables. Thus, we hear of *oaks* of a thousand years, of *cedars* of two thousand, and of *baobab* of six thousand years old! while many plants do not survive more than a few months. I can only speak here of the influence of time in the disorganization of the textures after their life has ceased.

"181. Experiment, in accordance with the testimony of history, proves that, if excluded from the contact of moist air, woody matter, like most of the other organized substances, may be preserved for an indefinite period. The plants which are found in coal mines, where they had lain for ages, still retain their stems, their leaves, and their textures, without essential alterations. In the coffins of Egyptian mummies we find planks still possessing their original appearance and hardness, provided they have been covered with a coating of paint to protect them. The linen cloths in which the mummy is wrapt have lost little of their original flexibility and strength. Under the bandages which are wrapt round the mummy we often find packets of herbs, which may be analyzed just as easily as the herbs of our gardens. Their roots, stems, leaves, petals, stamina, pistilla, and seeds, are in no respect altered; the fecula itself is found in the organs of the grain with all its characters undecayed, and yet these tombs are in many cases nearly three thousand years old. At a certain depth, too, under water, woody matter is preserved indefinitely, as is proved by the durability of piles.

" 182. But if the woody matter be not protected against the action of air and moisture, the case is very different. By degrees its hydrogen and oxygen are discharged, and the carbon predominates more and more. Thus the particles of the texture are disintegrated gradually, their white colour fades, and passes through all the shades till it becomes jet black, and, if this altered woody matter be exposed to heat, it is carbonized without flame, because it does not contain a sufficient quantity of hydrogen. These phenomena are seen not only in wood which is cut and left exposed to the air, but also in the bark which has become useless for vegetation; and the change is the more complete in proportion as the exposure to atmospheric influence has been longer."

The subject of *Ulmine*, *Humus*, or Mould, and *Geine*, contains several rather new and interesting views; and the author makes some ingenious applications to the theory and practice of agriculture.

The chief point in this chapter interesting to the medical reader is a new explanation of the reason of the superiority of linen over cotton rags for making charpie. The reason assigned by most authors for the unfitness of cotton, he states, was the triangular, or rather trilateral, shape, with cutting edges, of the fibrils of that plant, which might contribute to cut the flesh. This explanation he regards as not only ridiculous but insufficient, as he maintains that bodies so minute could produce no injury upon an inert clot, and he further maintains, that the alleged fibres are invisible under the microscope. The true reason he maintains to be the following. The fibrils of cotton are tubes analogous to the minute hairs of the *gramineæ*, formerly mentioned,—which are flattened by desiccation, and resemble then a ribbon with soft borders and a raised edge. If charpie acted mechanically, flax charpie would be more detrimental than cotton, the converse of which is the fact. The true and natural explanation M. Raspail finds in the properties of capillary attraction respectively possessed by each substance. The fibrils of flax are hollow tubes, he tells us, open at each end, which have been emptied of all their contained juices by the watering which they had undergone. The fibrils of cotton, on the other hand, are hairs closed at both ends, and filled with a substance tending to organization, which no watering or washing can remove. He infers, therefore, that for the absorption or imbibition of blood or purulent matter, the tubes of flax are better adapted than those of cotton, and that charpie made of the latter will absorb nothing, but merely allow the fluids to pass between its constituent fibres.

In treating the physiological and chemical history of *hordeine*, M. Raspail denies the independent existence of that principle as distinguished by Proust and others, and maintains that it is simply bran in a state of minute chemical division. As it is impossible to say how far conclusions are well founded when derived from microscopic and micrometrical observation, of the accuracy of which few are competent to judge, we subjoin the following passage, as giving the view of the subject in the statements of the author himself.

" Hordein, then, is nothing but bran more minutely divided than that which remains on the bolter, which, in consequence of the minuteness of its fragments, has passed through its meshes along with the fecula and gluten. In Proust's experiment, the membranes of the fecula and the fragments of the pericarp are diffused in the liquid by boiling, and the latter subside rapidly when the liquid is left at rest; after which, these fragments of bran may be obtained nearly pure by washing.

" This, then, is the history of the substance to which Proust devoted three large memoirs, and to which he assigned so important an office in the act of germination;[*] and, but for my researches, it is highly probable that it would have still long retained its importance in the catalogues of science. By direct consequence, it appears certain, without having recourse to experiments, that all the grains which are furnished with an involucrum or a resinous pericarp would be capable of yielding more or less of this minutely divided bran by being subjected to the processes which I have described.

" I speak here only of the hordein of Proust; for Thenard[†] has evidently confounded two distinct substances under this name, the lees of wine, which are pellicles arising from a cryptogamous vegetation or the cohesion of particles of gluten, and the hordein of Proust, which I have just proved to be only bran minutely divided. But it will be said, if hordein be nothing but minutely divided bran, how is it that grains of nearly equal volume, but belonging to different species, furnish so different quantities of this residue? How is it that barley gives 55 from 100 of farina, while wheat yields scarcely 20 in 100? The anatomy of the two grains furnishes a satisfactory answer to this double objection. I shall not speak here of the calicinal plates which closely cover the grain of barley, and whose fragments, mixing with those of the pericarp, must increase the quantity of the precipitate. Nevertheless, it is well to observe that these calicinal plates, by their attachment to the pericarp, must have imparted to this organ physical modifications which will not exist in the grain of wheat. That this is the case is proved by dissection; for, if we make a transverse slice of each of these grains we shall perceive that the pericarp of the wheat (315) peels off entire like a circular band, while that of the barley (316) can only be detached in small fragments. Now what takes place under the edge of the scalpel will also happen under the pressure of the millstone; consequently the bran will be more minutely divided in the farina of barley than in that of wheat. In bolting flour, therefore, it will remain on the sieve, while in the other its almost microscopic fragments will pass through with the fecula and gluten, and will be almost inseparable by mechanical means from the farina.

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[*] " With regard to the hordein, in fine, which has been diminished by germination from 55 to 12, What has become of it? Has it been changed into fecula?

How many researches would be necessary to answer these quesions.—Ann. de Phys. et de Chim. v. 344.

[†] Traité de Chim. iv. 230, 304, and 315

" The proof of what microscopic analysis has disclosed is furnished on the large scale by pearl barley. It is known that this substance is prepared, principally in Holland, by separating the millstones, so that, instead of grinding the grain, they only roll it round, and by rubbing deprive it of its pericarp and embryo. The grain of barley then appears under the form of a white pellet similar to the pellets of sago (97,) whence its name; and these pellets retain none of the pericarp, except that portion which being enclosed in the posterior groove of the grain could not be rubbed off by the millstone.

" Now, if this substance be ground, we obtain from it a farina as white as that of wheat, and containing only a very minute portion of hordein, equivalent to the amount of those fragments of the pericarp which had been protected by their situation in the posterior groove of the grain (309).

" These results are so easily obtained, and so easily comprehended, that one would conclude, that they could not have escaped the notice of millers and bakers, and others who are in the habit of observing and using various kinds of farina; and, in fact, any one who reads, with Proust's memoir in his hand, the essays which have been published on the subject of panification, will often, in one or two phrases, meet with a refutation of this elaborate memoir. *

" 'Barley flour,' says Parmentier, † 'is almost always defective on account of the bran, whose rough and sharp texture renders it harsh to the touch. The dough which is made of it is brittle and more short than that of rye, whence it is easy to conclude that it cannot yield a well-raised bread. In order to make the most of barley, the millstones must be separated so as only to bruise the grain and remove all the bran. Barley thus cleaned may be ground as groats are; and we obtain from it several sorts of farina, which either when mixed or employed separately, are sufficiently coherent when mixed with water and made into loaves.' 'The best farina,'

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* My refutation is more in detail; but this arises solely from the fatality which weighs down science. Errors take root easily under the sanction of high names; and, to uproot them afterwards, many efforts and much patience is required, and the demonstration must be pushed to the last point.

† Parfait Boulanger, p. 566.

says Matthiolus * 'is that which has not been finely ground, and which has been kept for some time, and which yields rough bran; for the bread made of farina too finely ground always contains bran.

"Now that I have demonstrated the identity of hordein with the pericarp of the cereales, it will be easy to explain why we obtain so little hordein from barley after germination, (324, Note). The pericarp after germination separates from the perisperm, whose gluten is decomposed, and whose fecula has been appropriated to the nourishment of the embryo; and it has become less brittle and more elastic by imbibing water. It will not, therefore, now be ground by the millstone into minute fragments which can pass through the bolter, but will remain on it in the form of ordinary bran. This is the cause of the error which led Proust to believe that the hordein was diminished, and the fecula proportionally increased, which, on the contrary, it is evident that the fecula is diminished by being sacrificed to the nutrition of the embryo, and that the hordein remains unaltered, because of the incorruptibility of the resin which fills the cells of the pericarp, and the unalterable nature of the external layer, whose cells contain nothing that is capable of fermenting."

The Second Division of the volume, however, on the chemical history of animal substances, is naturally the most important to the medical reader.

One of the most extraordinary views brought forward in this part of the work, is that which represents the adipose granulations of animal bodies to be analogous to those of starch or fecula in vegetables, in structure and disposition, in their uses in the economy, and in the mode of developement.

In treating of albumen he rejects the opinion of chemists, that it is a quaternary compound of nitrogen, hydrogen, oxygen, and carbon; and, as he had maintained of gluten, that the ammonia therein produced is not the result of the combination of nitrogen and hydrogen, but is partly formed during the process of organization, and is partly the result of the methods of decomposition, so he argues that albumen may be viewed as a compound of an organized substance, that is carbon and water, with ammonia or an ammoniacal salt, and carburetted hydrogen. This, however, it must be observed, is mere matter of opinion, and is only the mode in which M. Raspail accounts for the presence of ammonia in the decomposition of animal substances.

In speaking of the membranous substance of animal organs, M. Raspail represents the membranes which appear to the naked eye after minute dissection to be simplest, as presenting a very complex structure, and consisting of a train or layer of cells aggregated together, but not communicating, and each of which exhibits a *nucleus* in its centre. The only simple animal membrane he allows to be, the investing membrane of one of these cells, or as it is found in the innermost enclosures of the adipose tissue, and still better, in the large air-cells of which the lungs of the frog and similar reptiles consist.

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* Comment. on Dioscorides, p. 166.

In this state of simplicity, the membranous tissue is so attenuated, that it possesses a retractive power nearly equal to that of water, and of alcohol, and it can be distinguished only by the folds formed by motion on its surface. When, on the contrary, it consists of several superimposed membranes, however white it may appear by reflected light, it decomposes the refracted rays, and transmits only the yellow ray to the eye, provided it contains no adventitious colouring matter.

He then proceeds to show that the representations given from microscopic observation by Prevost and Dumas, Home and Bauer, and Milne Edwards, of the intimate structure of animal membranes, were entirely wrong, and, in short, imaginary altogether; and that the cause of the illusory appearances which they observed was neglect of the circumstance now mentioned, that the membrane was not presented to the eye in its most simple state. In the simple investing membrane of any cell,—that is, the primitive or elementary membrane, it is impossible to recognize any marks of structure whatever; and though analogy inclines the author to suppose that these membranes, so simple in appearance, are composed of primitive globules arranged spirally round the ideal axis of the cell, yet he takes care to say, that the means of observation are inadequate to enable us to determine the fact with certainty.

It is remarkable that in this view we see no notice taken of the observations of Dr Hodgkin and Mr Lister. Perhaps the author includes them under the general head of the observations of Prevost and Dumas, and Milne Edwards. But in this we must inform him, that he is mistaken; since the observations of the former gentleman by no means agree with the results of those obtained by M. Prevost and Dumas or Mr M. Edwards. Dr Hodgkin and Mr Lister did not recognize the globular structure.

He then proceeds to consider in successive order the structure of the muscular tissue, the nervous with the brain, the bony tissue and the teeth, ligaments, tendons and cartilage, the horny tissue, the tissues employed in the organs of respiration, the embryal tissue, and lastly, the parasitical and the spontaneous tissues.

In considering the tissues employed in the function of aqueous respiration, though M. Raspail takes a full view of the *cilia* and other contrivances for producing currents of water towards the animal, we must be allowed to say, that it appears to be a piece of rather culpable negligence that the author no where mentions the very satisfactory experiments made on this subject by Dr Sharpey in the larva of the frog, and in several of the molluscous tribe of animals, in the *Annelides*, and in some of the radiated animals. These experiments, which were published in the 34th volume of this Journal, have the merit of being not only the first on the subject in this country, but of demonstrating with great clearness the existence and the causes as well as the physiological uses of these currents.

In the third and fourth parts of his work, M. Raspail considers the physiological and chemical history of the *vegetable and animal substances* tending to organization; and here we have a minute history of the chemical properties of all those substances which are the products of living action either in plants or in animals; as gum, sugar, &c. in the former, and milk, blood, &c. in the latter.

In the fifth and sixth divisions we find delivered the chemical history of those substances of the vegetable and animal kingdom, which, according to the theory of the author, are undergoing organization; for instance, the several forms of fatty and oleaginous matter, wax, chlorophylle, bile, saliva, and pancreatic fluid.

The seventh division of the work is devoted to the chemical history of organic substances, vegetable and animal, which are the products of organization, regular and irregular, and the products of disorganization, regular and irregular; and under this head we find a tolerably full history of the vegetable acids, the vegetable colouring principles, fermentation, and the production of miasmata, alcohol, the ethers, and lastly, the vegetable alkaloids, and the artificial or factitious acids;—silk, the animal colouring matters, mucus, and the various secreted principles, purulent matter, and artificial products.

Under the head of the Irregular Disorganization of Living Tissues, we find some observations on Itch and the alleged parasitical animal of that eruption, which may not be void of interest.

"*The Itch.*—The cause of this eruption has long been supposed to be the presence and the bite of an insect, which, however, had been sought for in vain in the pustules of those cases of itch that occurred in Paris. In 1812, Gallée announced, in a professional thesis, that he had discovered this insect more than two hundred times in the patients labouring under this complaint in the hospitals of the capital. He engraved a beautiful figure of it; and showed it even alive to a commission of physicians and naturalists. From that time, however, no other observer was so lucky as Gallée had been. This was not surprising; for, as I proved in 1829, the memoir of Gallée was nothing but a pure mystification; and, instead of the insect of the itch, he had submitted to the inspection of the commission the mites of flour and of cheese. At the same time, in the essay which I published to refute the memoir of Gallée, whose authority had become established, I admitted at the outset, that this mystification ought not to lead us at once to conclude against the existence of the insect of the itch, which had been spoken of by the most conscientious observers; and that in another climate, or perhaps in another variety of the disorder, it might possibly be found. The question remained in this state, when I had occasion to observe the itch of the horse, and here I found the insect which had been noticed by Degeer, and of which he had given a figure, though rude and ill-designed. As this question has acquired a certain degree of importance in medicine, I have given a figure of this parasitical insect, (Pl. x. fig. 7, 8, 9,) with all the details which I could observe, by the aid of a magnifying power of 100 diameters. The insect of the itch has a white shining body, and its feet, as well as its snout, are crimson, if they be observed by reflection; but when seen by refraction, they are transparent and yellowish. But what constitutes a wide difference between it and the insect of flour (*Sarcoptes* of Gallée, *Acarus Scabiei* of Fabricius,) is, that in the latter the eight feet are all placed round a breast-plate on the thorax, while in the itch insect of the horse, the two anterior pairs are placed closely beside the head, forming a kind of fan, and the other two pairs are separated from them by a considerable interval, and inserted two and two on each side of the abdomen. The feet, and more particularly the head, spring out of so many sheaths, which gives to the body somewhat of the general form of certain flattened Echini, or of the scales of certain fishes. The two anterior pairs of feet are twice as long as the head, the third pair are considerably longer, and the last pair are the shortest and most slender of the whole. The feet are composed of five articulations, of which the one next the body has the shape of a right angled triangle, whose hypothenuse is formed by a line directed as a radius from the head. The last articulation is terminated by two hairs (of considerable length on the third pair of feet), and a long transparent and flexible band composed of two articulations, and ending in a sucker or viscid cushion, by which the insect attaches itself to the surface on which it moves, and which gives this organ the shape of a trumpet. The superior articulations are each furnished with one or two hairs. The head is pyriform, and lengthened out into a retractile sucker, and between this sucker and the head are placed the eyes, which are transparent, but scarcely projecting. Anterior to them are observed two small club-shaped antennæ, and close to the orifice of the mouth are two feelers of similar form and length. The form of the male is somewhat different from that of the female. The latter is considerably larger and more convex, and the inferior part of the abdomen is rounded and armed on each side with a tuft of four hairs. The male, on the other hand, is flatter and considerably less oval, and has at each side of the anus a large tubercle divided into two parts by an articulation, and terminated by two hairs of considerable length. The female is about .0139 of an inch in length, and about .0129 in breadth. The male (*a*) and the female (*b*) are represented in the act of copulation in fig. 9. This animal resists the vapour of a sulphur match, and I have seen it move during upwards of three hours in a solution of chloride of calcium.

"I am satisfied that this insect will be again discovered in the pustules of the itch in warm climates, or at any rate in climates different from that of Paris; for the figures of Degeer, rude as they are, show sufficiently that the insect which he observed is not different from the insect of the itch of horses. But the chief deductions from these results is, that the insect of the itch, instead of being the cause of the complaint, is only a parasite attending it. It is probable also, that the itch of northern climates is specifically different from that of southern regions. I have seen one of my pupils in Paris inoculate himself with the itch with impunity, and it is there much less contagious and more easy of cure than in warm countries."

The last division of the work is devoted to the chemical history of those principles to which M. Raspail applies the name of *Bases of the Textures*,—understanding by these, incrustations of crystallized silica, phosphate of lime, oxalate of lime, &c. earthy or saline matters combined with the elements of the tissues, and saline matters dissolved in the liquids of the organized tissues.

Our limits do not permit us to enter into the detailed examination of all these topics. Nor is it in any way necessary. To have a complete understanding of the method and peculiar principles of M. Raspail, it is requisite to peruse his work with considerable attention. In order, however, to enable those who have not the requisite leisure to undertake this duty,—to frame some conception of the general character of his reasonings and doctrines, we may subjoin the following extract, in which the author professes himself to give a summary of the principles, the justice of which it is his object to demonstrate.

"1437. I should leave my work incomplete if I were to conclude it without, at least, succinctly summing up its results. Microscopic chemistry and anatomy have put it in our power to study as it were, piece by piece, the skeleton of organized bodies; it belongs to physiology to gather and unite the scattered members, to group them according to their immediate relations, and to view them as possessed of motion and life.

"1438. Such, then, is the object of this summary, which though brief, is not the less on that account the fruit of much reflection and of a long series of observations.

"1439. An atom of *carbon* and an atom of *water* unite to form an *organic atom*, which form is spherical; this organic atom then unites with a *base* in order to form the parietes of a woody texture if the base be fixed, or of a *glutinous* or *albuminous* texture if it be ammonia.

" 1440. The matrix (type) of every formation of a texture is a cell, unperforated as far as our means of observation inform us, but whose coats are capable of *aspiring* and *expiring* liquids, and in a manner selecting the materials which are afterwards elaborated in the interior of the cell.

" 1441. Every cell, in order to elaborate for the purpose of its own growth the materials which it contains, requires to receive a vital impulse, that is to say, a fecundation adapted to its own nature. Each cell becomes then capable of reproducing its like, as the embryal cell reproduces the general type of the being which was, as it were, epitomized in it, and which in order to its developement, only required the vital impulse of what is termed the *male.*

" 1442. The immediate effect of this vital impulse *tending to fecundate* is to cause on the inside of the coats of the fecundated cell the formation of a centre or focus of action, which then becomes in its turn the agent *tending to fecundate* all the cells of the new being. The nerve in the vegetable, and the cerebro-spinal system in animals, are this central agent of developement, and it is from thence that the organization proceeds to the right and left, so that every organ and every organized being is symmetrical in its accessories, and not symmetrical in regard to the agent that fecundates it; and the distinctions in this respect, which are admitted in our classifications, are merely founded on greater or less inequalities in the developement of the external appendices, and not on any essential difference in the organization.

" 1443. Under the influence *tending to fecundate* of the central agent of developement, various appendices are produced and grow. Some of the cells become encrusted with calcareous salts, and others acquire the faculty of dilating and contracting. Canals are formed by separation of part of the parietes of the cells, whether secondary, tertiary, or of any other order, to allow of the circulation of the juices, around the organs whose office it is to elaborate them. But the formation of bones, and the developement of muscles, or of any other organ in one direction rather than another, are but incidental circumstances derived from the general type of the organization; and, accordingly, in those controversies which have no other object than to trace in one animal the form of another, or to find the same number of bones or muscles in each, both sides may be maintained with equal success. Animals and vegetables are moulded on the same essential type; and all those varieties which confuse the most practised memory have been produced by the developement, in one part of the scale of a cell, which in another part assumes a different mode of developement, or remains undeveloped.

" 1444. I have already explained the theory of what I have called the *vesicular developement* of the human embryo (626) and of the trunk, the roots, and the leaves of vegetables, (175.) The same theory is applicable to every organized being, and it was this that made me say in the very beginning of this discovery, '*Give me a vesicle in whose interior other vesicles may be formed and developed in the way I conceive, and I will shew you the organized world.*'

"1445. It still remains to explain in what manner the flower and the fruit are derived from the trunk and the leaf, and how the type of the many thousands of flowers which are enumerated in our lists may be reduced to two or three elements.[*] The calyx is a leaf, in whose interior the terminal bud by which the stem would have been continued, is devolved into a flower. The form of this calyx varies as that of the leaf does; but we may always observe in it a central nerve which is placed on the opposite side to that of the leaf immediately under it. This calyx was in the beginning close and imperforated, and furnished at its summit with rudimentary organs, whose form corresponds to that of the stigmata of the female organ, and which seem destined to perform the same functions. In these circumstances the calyx performed the office of an ovary, and was acted on by the fecundating influence of the leaf below it, which, at the period of its maturity, fulfilled the office of anthers.

"1446.—Within the calyx is found the corolla, whose median nerve is opposite to, and facing the median nerve of the calyx. The corolla is, like the calyx, at first imperforated, and exhibits a similar confirmation. The anthers form an apparatus which sometimes is opposite to the corolla, and then represents, as it were, a decompounded leaf, and sometimes is merely a prolongation of the corolla itself. Above them is seen the ovary, which is nothing but the trunk or internodium in miniature, one or more of the cells of which have each produced an ovulum by the developement of a cell of their coats, instead of producing a new cellular texture adhering closely to them. The stigmata which crown it are nothing but rudimentary leaves, whose median nerve is opposite to that of the organ immediately inferior to them.

"1447.—In the cruciform plants we find the same order of alternation, notwithstanding the even number of segments in the calyx, and of petals in the flower; and it is remarked, that one of these segments taken by itself represents a leaf, while the next succeeding leaf is represented by three divisions, of which the middle one is opposite to the preceding segment and the succeeding petal. The stamina, including those that have remained in the form of glands, compose two distinct sets, one consisting of five divisions, and the outer of three.

"1448.—The flowers of the synantheræ are nothing but agglomerations of flowers, each produced in the axilla of a petaloid leaf, and pressed together in close spirals round the stem; but here the corolla is the leaf which crowns the stem or ovary, and it gives origin to the stamina, while the stigmata arise from a superior leaf.

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[*] See Ann. des Sc. d'Observ. iv. 280, on the subject of the complete adoption of this theory by botanists, who had at first rejected it with the greatest pertinacity.

" 1449. This sketch will suffice as a basis for all the applications, which will be given more in detail in another work.

" 1450. The surface of a portion of the intestinal canal in animals performs the office of the radicular suckers of vegetables, being destined to absorb the salts that are necessary for the organization of the textures. Another surface, covered with an atmosphere of water, either liquid or in the form of vapour, (the *branchiæ*), and the lungs, has for its office to absorb the gas destined to modify the nature of the *substances tending to organize,* and thus to promote their organization. The leaves and other herbaceous organs of plants perform the same functions. We might, then, conceive animals whose *radicular suckers,* if I may use the expression, might be placed on some external part of the body, that is, in which the skin might perform the functions of the intestinal canal, by absorbing the juices and salts dissolved in the surrounding liquid; in short, whose surface might be a *stomach* as we have seen, that it may become a *branchia;* and it is possible that it may be one day discovered that in this respect the most simple of the microscopic animalcules are not differently organised from the Hydra.

" 1451. The power of motion and sensibility which characterize the superior animals, diminish by successive gradations as we descend in the organic scale, in such a manner, that in the mutual confines of the vegetable and animal kingdoms, they seem to disappear, and to be effaced altogether, although this is merely because they are no longer appreciable by our means of observation. Nevertheless, we see them make their appearance here and there in the vegetable kingdom, as in the leaves of the *Mimosa,* the stamina of the Berberis, &c."

In conclusion, it is impossible to deny that this treatise contains several new and ingenious views on the constitution of various organic bodies, and that the principles therein unfolded may tend very materially to rectify our notions on several important questions in physiology and pathology. It must also be observed, that the tables of the atomic constitution of many bodies and organic principles, though by no means original, are, nevertheless, highly instructive, and are of great utility in exhibiting before the eye of the reader, facts for which he finds that he must consult many volumes. It is needless to say, that by all who are desirous to form correct ideas on the chemical constitution of organized bodies, this work should be diligently studied; for though neither perfect nor free from defects, without it, nevertheless, our information in this department would be still more defective.

Of the translation by Dr Henderson, we cannot speak too highly. M. Raspail may congratulate himself that his work is introduced to the English reader by a gentleman who, to a correct knowledge of the idiomatic niceties of the language in which it is written, and complete command over the resources of his own language, conjoins thorough acquaintance with its subject, and whose general information in the physical and physiological sciences so peculiarly qualifies him for facilitating the difficulties and illustrating the obscurities of a branch of science which abounds so much in both. Dr Henderson has also enhanced much the value of the translation by many instructive notes, either as corrections of mistakes, or as supplements of defects of the author. The translation, indeed, will answer every purpose of the original treatise.

Art. V.—*Des Hémorroïdes et de la chute du Rectum, &c. On Hemorrhoids and Prolapsus of the Rectum.* By A. Lepelletier of Sarthe, Professor of Physiology and Pathology, &c. 8vo. Paris, 1834. Pp. 168.

In the 24th and 41st volumes of this Journal, the various diseases affecting the *rectum* were minutely passed in review, and all that was known on the subject was laid in a condensed form before the reader. The work before us supplies us with no new information, and does not merit a detailed account. As a work it is respectable, but not at all called for; and those in possession of the publications of Mr Copland, Mr Calvert, or Mr Mayo, will not find it necessary to possess themselves of this. Its contents we shall briefly notice.

A short account of the anatomy of the *rectum* is followed by a catalogue of the opinions of various authors regarding the nature of hemorrhoids, of none of which M. Lepelletier approves. Hemorrhoidal tumours he divides into erectile and varicose. The predisposing and occasional causes, the symptoms, pathological anatomy, the progress, complications, terminations, and the diseases with which they may be confounded, the prognosis and treatment, and the plans by which a recurrence of the disease may be avoided, are passed in review, one after the other, and the opinions of various authors cited. On this subject the author has little or nothing of his own to offer, except a few cases, such as every man in hospital practice can produce; and in citing the opinions of various authors, we look in vain for any critical comparison of them, such as we might have expected from a work with such pretensions to learning. *Prolapsus* of the *rectum (chute du rectum)* the author divides into invagination and prolapsus. The former, which he considers to be generally more severe than the latter, consists in the falling down and introduction of one part of the cylinder within its continuation. *Prolapsus*, on the contrary, is the simple displacement of the mucous coat, which separates from the muscular, in consequence of the loose manner in which they are naturally united, and projects more or less from the *anus*. On the treatment of these two troublesome affections M. Lepelletier offers nothing but a list of opinions.

The work is concluded with a list of upwards of two hundred authors who have written on the subject discussed in this treatise. To this list it would not be difficult to make many important additions. On the whole, though this work may be useful on the continent, it is not calculated to be favourably received here, where we have access to so many sources of information, both theoretical and practical.

ART. VI.—*Essai sur la Leucorrhée et les causes diverses qui la produisent, &c. Essay on Leucorrhœa and the different causes which produce it.* By M. BUREAUD RIOFREY, D. M. P., &c. 12mo. London and Paris, 1834. Pp. 161.

THOUGH the vagina is continually moistened by its own mucous secretion, by that from the *cervix uteri*, and by the exhalation from the lining membrane of the *uterus* itself, the balance, in a state of health, between secretion and absorption, is so well maintained, that, except during the flow of the *catamenia*, or after delivery, or from excitement of the organs themselves, no fluid escapes from the *vulva*. But this perfect balance between the secretion and the absorption may be disturbed, and the quality of the fluid altered in three ways, *first*, by suppression of the *menses*; *secondly*, by any continued excitement of the organs of generation; and, *thirdly*, by a deranged state of the general health. To every discharge from the vagina produced by these three causes, and which, consequently, is neither menstrual, puerperal, sanguineous, nor gonorrhœal, the terms *Leucorrhœa* and *Fluor Albus* have been applied; and hence, under the same title have been arranged a simple disorder, requiring for its removal nothing more than the avoiding of its cause, and diseases which undermine the constitution and shorten life. No doubt, most modern teachers and writers carefully discriminate between the different kinds of discharge and the affections of which they are symptomatic; but surely it would be more philosophical—more in accordance with the present state of pathology, to reckon these morbid discharges merely as symptoms of different diseases, instead of so many varieties of the same affection. Whatever explanations may be given, the present mode of treating the subject tends to produce confusion of ideas to the student; and, consequently, the sooner it is abandoned the better.

Were it desirable, it might be shown that all morbid discharges from the female organs of generation may be arranged under two heads, *first*, those resulting from organic disease of the parts, and, *second*, those arising from functional disorders, it being always understood that both may exist simultaneously, and that they may reciprocally stand in the relation of cause and effect. We shall nôt, however, detain the reader with any further observations on the subject at present, but proceed to place before him a very brief account of the treatise, the title of which is prefixed to this article.

Dr Riofrey's little work consists of a preface, a collection of cases illustrative of various causes which produce *leucorrhœa*, and the treatment applicable to each; a short statement of the author's views; and some observations on the anatomy of the *uterus*, on menstruation, and its irregularities. The greater part of the book is taken up with the details of cases and the author's remarks on them; but a brief statement of his conclusions is all that we can make room for.

He maintains that *fluor albus* is in reality only a symptom—that it is absurd to treat a symptom—that when *fluor albus* indicates serious disease of the *uterus*, this disease is at first under the power of surgery, and demands the most energetic measures—that frequently all loss of time is irreparable—that there is no specific for *fluor albus*, except that discernment which recognizes the true cause and suggests the appropriate remedy—and that, even supposing that there were a specific which would cure one set of cases, it is likely that it would be prejudicial in all others not produced by the same cause. Let the word *leucorrhœa* be retained in medical language as a common term to express all morbid discharges from the female organs of generation, but let it be only the name of a symptom.

From these views, it may be easily inferred in what way Dr Riofrey will treat *leucorrhœa*. He particularly insists on the early examination of the affected parts in all obstinate and suspicious cases. All empirical treatment he of course discards. His first endeavour is to remove the cause; and he totally disapproves of all measures which would have the effect of getting rid of the discharge by applications to the affected membranes. For the facts which illustrate and support the author's doctrines, we must refer the reader to the work itself; satisfied that, whatever may be thought of the theoretical part of it, the practical portion will compensate for the time bestowed on its perusal.

Art. VII.—*On the Reflex Function of the Medulla Oblongata and Medulla Spinalis.* By Marshall Hall, M. D. F. R. S. L. and E., &c. &c. Received June 11, read 20th June 1833. (From the Transactions of the Royal Society for 1833, Part II.) London 1833, 4to.

In considering the influence of the nervous system upon the various phenomena of muscular action, physiologists have in general supposed, that the influence, energy, or power of that system is transmitted from some of its central portions, as the brain or spinal chord, to its peripheral ramifications, and the organs to which these peripheral ramifications are distributed. It was only in the case of sensation that they imagined the impression made on the extremities of the nerves to be transmitted to the central region of the system. If this doctrine be not explicitly stated, it is at least implied in the writings of Haller, Tissot, and most of the contemporaries and pupils of the physiologist of Berne.

By Soemmering, who may be regarded as one of the ablest of the Hallerian followers, and one of the fairest in expounding and condensing the doctrines of Haller, it is very distinctly expressed in the following precise terms. "Igitur *in* nervis, vel *circum* nervos, vel *per* nervos duplex motus observatur, *alter* ab organo quodam cerebrum versus, quo sensus excitatur, *alter* a cerebro musculos versus, qui eos ad contractionem cogit; sive *vis sentiendi versus cerebrum tendit, vis vero musculos ad sese contrahendum cogens, a cerebro ad musculos tendit.*"* Bichat also, who in this matter may be placed in the same physiological sect, expresses himself in a very similar manner. "The nervous influence," he observes, "is propagated only from the superior to the inferior division of the nerve, and never in the opposite direction. Cut a nerve in two; its inferior part when irritated will cause the subjacent muscles to contract; it is vain to stimulate the superior division, which causes no contraction in the superior muscles. In like manner the spinal chord divided transversely and irritated from above downwards, produces a sensible effect in the latter direction only. *Never does the nervous influence ascend in the excitement of motion, as it does in that of sensation.*"†

In this condition nearly the doctrines regarding the supposed direction of the assumed Nervous Influence, in regard to the contraction of muscles, remained till the year 1823, when MM. Prevost and Dumas of Geneva, in a memoir on the Phenomena accompanying the contraction of Muscular Fibre, read in August to the Academy of Sciences, and afterwards published in the third volume of the *Journal de Physiologie Experimentale* of M. Magendie, brought forward views somewhat new. These gentlemen, observing by the microscope, that the fibres of a muscle in contraction formed a series of angular flexures, and having ascertained that, while the nervous trunk is parallel to the direction of the fibres of the muscles, the nervous filaments distributed in the interior of the muscles, were in their ultimate ramifications, invariably at right angles to the fibres of the muscles, and either returned to the trunk, or anastomosed with other filaments, and further, that when a muscle was made to contract under the influence of galvanism, the *apices* of the angles of contraction invariably corresponded to the insertion of these very minute nervous filaments,—arrived at the conclusion that nervous influence is very similar to galvanism, and that like it, there must be two currents, an ascending and a descending one, or, in other words, that, in muscular contraction, the nervous filaments become the vehicles of two different species of influence, one proceeding from the cerebral to the ramified end, and the other proceeding in the retrograde direction, from the ramified to the cerebral end. That we may not, however, misstate the views of these physiologists, we subjoin their inferences in their own words.

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* De Fabrica Corporis Humani, Tom iv. § 188.

† Anatomie Generale, Tom. iii. p. 277.

"All these experiments apply equally well to the explanation of the phenomenon of muscular contraction and of that of sensation. When, indeed, a nerve is treated with one of the agents now mentioned, the brain becomes conscious of acute pain, and the muscle evinces the ordinary signs of irritation. In the first case the electricity developed traverses the brain; in the second it traverses the muscle. We do not positively pretend to designate here the physical conditions of the important and mysterious phenomenon of cerebral perceptions. We desire merely to indicate and demonstrate how possible it is to conceive, in the present state of physiology, the transport of actions developed at a great distance from the brain itself."*

"*Lastly*, we have rendered the inference probable, that there are in the nerve two currents, one ascending, the other descending; and were it permitted to anticipate the results of experience, we would be disposed to think that these currents proceed to the anterior and posterior parts of the spinal chord, by means of the corresponding roots."†

It is here manifest that, throwing out of the question the gross and improbable fiction of the resemblance or rather identity between electricity and the supposed nervous influence, the leading and essential character of this hypothesis of nervous influence over muscular action, are the circumstances of some impression being conveyed to the brain or spinal chord, and some stimulus being simultaneously directed to the ramified extremity of the nerve.

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* Journal de Physiologie Experimentale, Tome iii. p. 327.

† Ibid. p. 338

We shall perhaps take some future opportunity to show, that the whole doctrine rests on a fallacy, and that it owes its birth chiefly, if not entirely, to the natural slowness of our conceptions, to the difficulty we experience in forming an idea of any change in the constitution of any part without taking time into the account, and, above all, to our habit of endeavouring to render intelligible all physiological changes in living beings, by reasoning and speaking of them as if they were physical changes only, or so mechanical that they may be easily rendered obvious to sense.

It cannot be denied, nevertheless, that though MM. Prevost and Dumas appear to have been the first in modern times to bring this doctrine before the physiological world, they did not make of it any very evident or positive application in explaining the phenomena of muscular motion, and the occasional deviations to which it is liable. This defect was destined to be supplied by Sir Charles Bell, who also gave the doctrine a more explicit and intelligible shape. In a paper communicated by this author to the Royal Society on the 25th of January 1826, Sir Charles undertook to demonstrate the proposition, that, where nerves of different functions take their origin apart, and run a different course, two nerves must unite in the muscles, in order to perfect the relations between the brain and these muscles,—or, in other words, to prove the existence of a nervous circle connecting not only the brain to the muscles, but the muscles to the brain.

To this result Sir Charles Bell appears to have been principally led by his meditations on the distinctive properties of the sensiferous and motiferous orders of nerves; and he assures us, that it was chiefly the circumstance of knowing that the fifth pair sends a portion of its filaments to muscles as well as to purely sensitive organs, that urged the doctrine upon his mind. He found that in all instances of nerves going to muscles, twigs from two different sources went;—one, he informs us, a motiferous, the other apparently a sensiferous nerve. If all that be requisite to the action of a muscle, he argues, be a nerve to excite to contraction, the branches of the smaller division of the fifth pair ought not to have been accompanied by any sensiferous nerve; and he was then led to inquire whether muscles have any other purpose to serve than merely to contract under the impulse of the motiferous nerves. "For if they have a *reflective* influence," he adds, "and if their condition is to be felt or perceived, it will presently appear, that the motor nerves are not suitable *internuncii* betwixt them and the *sensorium*."

He then inquired whether it be necessary to the governance of the muscular frame, that there be a consciousness of the state or degree of the action of the muscles; and from various considerations he infers that there is; and as anatomical evidence shows, that the muscle is provided, in addition to its proper motiferous branch, with another nerve, which is equally necessary to its action, and equally deserves the name of muscular, he infers that this nerve has no direct power over the muscle, but circuitously through the brain, and, by exciting sensation in it, may become a cause of action.

The general conclusion is stated in the following manner. "*Between the brain and the muscle there is a circle of nerves; one nerve conveys the influence from the brain to the muscles; another gives the sense of the condition of the muscle to the brain.* If the circle be broken by the division of the motor nerve, motion ceases; if it be broken by the division of the other nerve, there is no longer a sense of the condition of the muscle, and therefore no regulation of its activity." In arriving at this conclusion, Sir Charles properly takes care to state, that the admission of a nervous circle by no means implies the supposition of circulating fluid.

Unaware apparently of these facts, or deeming them and their results as unworthy of attention, Dr Marshall Hall has undertaken in the present paper, to demonstrate the existence of a reflected or retrograding nervous influence, that is to say, one which proceeds from the ramified or distributed to the cerebral or cerebro-spinal extremity of the nerve. The operation of the usual causes of muscular contraction, he states, may be designated *centric*, as taking place *at* or at least in a direction *from* central parts of the nervous system. But of this other function, the phenomena are of a different order, and obey different laws, being excited by causes situate eccentric, or remote from the centre of the nervous system.

> "Many of the phenomena of this principle of action," he remarks, "have certainly been observed. But, in the first place, this function (viz. the reflex) is by no means confined to the limbs; for while it imparts to each muscle its appropriate tone, and to each system of muscles its appropriate equilibrium or balance, it performs the still more important office of presiding over the orifices and terminations of each of the internal canals in the animal economy, giving them their due form and action; and, in the second place, in the

instances in which the phenomena of the function have been noticed, they have been confounded, as I have stated, with those of sensation and volition; if they have been distinguished from these, they have been too indefinitely denominated instinctive or automatic. I have been compelled, therefore, to adopt some new designation for them, and I shall now give the reasons for my choice of that which is given in the title of this paper."

The author then informs us, that this property is distinguished by being *excited* in its action, and *reflex* in its course,—an impression being made on the extremities of the nervous filaments, and conveyed backwards to the spinal chord, and reflected along other nerves to parts adjacent to, or remote from, that which receives the impression. In all other kinds of muscular action, he observes, the motiferous influence is understood to proceed from some point in the central region of the nervous system,—towards one or other point of the ramified or distributed extremities of the nerves; and, in accordance with this principle, these motions have been observed to cease when the central parts of the nervous system are destroyed.

In that action, which Dr Marshall Hall ascribes to the reflex function of the nerves, and especially of the spinal chord, the power of motion may remain in part, after the brain and spinal bulb at least have been removed or destroyed, and ceases only when the spinal chord itself is removed.

In some of the subsequent observations on this property, we observe a want of precision in thought and expression; and we are left in doubt whether the author regards it as a property of nerves or of muscles. Thus, while the author observes that the first three modes of *muscular action* are known only by actual movements, he adds, that " the reflex function exists as a *continuous muscular action*, as a power presiding over organs not actually in a state of motion, preserving in some, as the *glottis*, an open, in others as the sphincters, a closed form, and in the limbs a due degree of equilibrium or balanced muscular action, a function not hitherto, I think, recognized by physiologists."

Now, in the statement of these two propositions, it would have been desirable that the author had expressed himself, as if the property to which he applies the name of Reflex Function were one either of the nervous system, or of the muscular fibre, and not indiscriminately of both. If it be a property of the nervous system, or a presiding power over muscular action, then it cannot be the same as muscular action. If its existence as a peculiar property is to be recognized, then it must, we conceive, be regarded as a property or faculty of the nervous system exclusively.

In making the concluding statement of the proposition, we believe that Dr Marshall Hall is somewhat mistaken. The varieties of muscular action now specified are exactly those which have been denominated antagonized actions; and if the influence of the nervous system in producing or maintaining these, has not attracted much attention formerly, it must be admitted by all those who have perused the account of the doctrines and experiments of Bellingeri, given in the present Number, on what that physiologist terms Nervous Antagonism, that he, at least, had considered them with no ordinary attention several years ago, and had made them the subject not only of speculation, in his Treatise on the Anatomy of the Spinal Chord, published in 1823, but of experimental research in the course of 1824. To his more comprehensive exposition of the same doctrine of Nervous Antagonism, published at Turin in 1833, we shall in our next Number direct the attention of the reader, and endeavour to show the application of this doctrine to the phenomenon in question. Meanwhile, however, we must attend to the statements and instructions of Dr Marshall Hall.

To illustrate the nature and importance of this property in the animal economy, the author adduces the example of the process of deglutition. This consists of several distinct acts, as the apprehension of food by the teeth, tongue, and lips, mastication, and the transmission of the masticated mass through the *pharynx*, with the closure of the *glottis*, the depression of the *epiglottis*, &c. The first action, he observes, is voluntary, and cannot be accomplished without the presence of the brain. The closure of the *glottis*, however, and the contraction of the *pharynx*, he represents to depend upon the reflex faculty, and to be practicable in animals in which the brain has been removed, or the ninth pair of nerves divided, but not in those in which the connection with the *medulla oblongata* has been dissolved. Thus, while the nervous connection between the *larynx* and the *medulla oblongata* continues entire, the *glottis* remains open, being slightly dilated during each act of inspiration; but, if this connection be interrupted by dividing the superior laryngeal nerves, the aperture immediately undergoes so great a diminution, that a state of excessive dyspnœa ensues. The *sphincter ani*, on the other hand, remains closed in the decapitated turtle (*Chelonia Mydas*,) provided the lower part of the spinal chord is left uninjured in the canal; but the moment this part of the nervous system is destroyed or withdrawn, the sphincter is relaxed, and the bowel opened. The action of both muscles, therefore, depends not on the brain only, but on the integrity of the spinal chord.

The author then proceeds to show, by experiments performed on several of the reptile family, that when the brain and me-

dulla oblongata are removed by division, and the body placed under an inverted bell-glass, so as to be protected from the impression of external *stimuli*, no motion takes place, but that the slightest external impressions in this state are followed by motion. From these facts, the author deduces three conclusions; *1st*, that sensation may induce motion by acting through the medium of the will; *2d*, that, in experiments of this kind, the *will* and not the *power* to move is annihilated; and, *3dly*, that, in experiments of the kind specified, volition being destroyed, and the agency of sensation excluded, the influence of the external impressions must have been exerted upon some property of the nervous system different from sensibility.

We have merely in this instance to direct the attention of our readers to the close coincidence between this doctrine and that established by Bellingeri in his experiments on Antagonism, and by Sir Charles Bell in his Memoir on the Nervous Circle, which connects the muscles with the brain.

Having thus rendered probable the existence of a principle of the nervous system different from that of sensibility, he further proceeds to inquire, by reasoning and experiment, into the nature and characters of that principle.

1. The experiments consist in decapitating a cold-blooded animal, so as to separate the brain and *medulla oblongata* from the spinal chord, and observing the effect of applying irritating agents to various parts of the surface of the body provided with muscular organs; and then observing the effect after removing the spinal chord. These, indeed, are materially different. Thus, on touching the eye or eyelid with a probe, the eye was immediately closed, and other shut simultaneously. On irritating the nostril, the mouth opened widely, and the submaxillary membranes descended. On carrying the probe up the windpipe and touching the *larynx*, the *glottis* was convulsively contracted. Upon withdrawing the spinal chord, however, none of these motions ensued, and irritants were then ineffectual.

Upon repeating the same experiment, and applying the irritants to the tail, limbs, and sphincters of the animal, the former were thrown into rapid motion, and the latter, though circular and closed, contracted still more forcibly. On withdrawing the spinal chord, however, remarkable changes were observed. The limbs no longer moved under stimuli, and became flaccid. The sphincter was no longer circular and contracted, but hung flaccid and shapeless. The tail was flaccid and inert on the application of *stimuli*.

From these phenomena Dr Marshall Hall infers, that, after the influence attributed to the brain has ceased to operate on the muscular organs of the animal, the spinal chord still continues control certain muscular organs, by an influence propagated from these organs towards the chord; and that the tone of the limbs, and the contractile property of the sphincter, depend upon the same reflex function of the chord,—"effects," he adds, "not hitherto suspected by physiologists."

2. This alleged property of the spinal chord, however, the author further argues, does not depend on the integrity of that part alone, but resides in its individual portions. Thus, if after severing the head of the turtle, the lower extremities and tail be separated together in the ordinary manner, the phenomena of motion of individual parts are still observed. In one experiment this phenomenon was evinced in a very remarkable manner. After removing the head of a frog, he divided the spine between the third and fourth *vertebræ*, and separated the upper portion of the trunk from the lower, making thus the head, the cervico-dorsal portion with the anterior extremities, and the dorso-lumbar one with the posterior, each distinct and independent parts with their corresponding portions of spinal chord. Each part retained its reflex function; all the muscular parts being susceptible of motion, when irritated, until the spinal chord was extracted,—when all motion ceased.

3. In the MAMMALIA these phenomena cannot be well studied unless when very young. But at this period they are distinctly observed. In a rabbit, one day old, they were observed after decapitation, but ceased on the spinal chord being destroyed.

They are farther observed in certain individuals of the Mammiferous class, which are occasionally or periodically in a state approaching to that of cold-blooded animals. Thus in the hedgehog (*Erinaceus Europæus*,) the motions assumed by the cutaneous muscle in the ordinary state, and those assumed by that muscle and the limbs, tail, *larynx*, and *sphincter ani*, persist after the brain is removed, but cease the moment the spinal chord is extracted.

Dr Marshall Hall next refers to the phenomena afforded by examples of acephalous fœtuses, and cases in which the brain had been accidentally destroyed,—in order to maintain the validity of his doctrine. No symptoms indicating sensation or voluntary motion, he concludes, ensued in these cases;—but respiration, the impressibility of the skin, the faculty of deglutition, and the power of the sphincters remained unaffected. In all these cases the spinal chord was entire. But, as in warm-blooded animals, the motions depend much on the integrity of the brain, death is the result of the absence or injury of this organ.

4. The author then shows, from the phenomena exhibited after the application of opium or strychnine to the skin in the mucous surfaces of a frog, that the reflex faculty is susceptible

of different degrees of intensity and abatement. The effect of the drugs is to render the animal tetanic, and if in this state decapitation be performed, the motions ascribed by Dr Marshall Hall to the reflex faculty, become manifest without stimuli, or with very slight stimuli. All these phenomena, however, cease the moment the spinal chord is extracted.

Hydrocyanic acid produces exactly the converse of these effects. It diminishes the intensity of the motions attributed to the reflex function.

From all these facts the author derives the conclusion, that the spinal chord possesses a faculty of receiving impressions from the ramified cords of the muscular nerves, and of thereby exciting in the muscles to which they are distributed, motions independently of the influence of the brain or *cerebellum.*

This doctrine he next proceeds to apply, in order to explain various phenomena evinced by many diseases seated in the nervous system.

Thus, as the reflex faculty, he observes, is most intense in young animals, he avails himself of this principle to explain the convulsive motions attending dentition, the croup-like or crowing respiration incident to infants, the vomitings, strangury, and involuntary discharge of urine and feces;—and one species of epilepsy, that, namely, depending on irritation of the extremities of a nerve or nerves, as in the case of disordered stomach or bowels, or even tumours or injuries of the nervous twigs. In the same manner he attributes the phenomena of spasmodic asthma, and those of tetanus and hydrophobia, to derangements in the influence of the reflex faculty of the spinal chord.

In order, however, to give a short view of the various peculiarities of the doctrine of Dr Marshall Hall, we beg to subjoin the following recapitulation made by that gentleman himself.

" 1. Many of the facts which depend on the reflex function have long been known to physiologists;

" 2. But these facts only extend to the excited action of the reflex function seen on the limbs, and even they have been erroneously ascribed to sensation and volition or instinct:

" 3. The facts of excited movements of the *larynx, pharynx,* sphincters, and ejaculators, and of the *panniculus carnosus,* have not been shown to be allied to them, and to be dependent on the same individual functions of the nervous system.

" 4. It has not been shown that this function, in its natural state, constitutes the principle of equilibrium and tone, or the whole muscular system, and the principle which presides over the orifices and sphincters of the internal canals;

" 5. And certainly not that this principle morbidly affected constitutes in different forms the diseases arising from dentition, and the diseases termed *tetanus, hydrophobia, chorea, paralysis agitans*, certain forms of epilepsy, of tremor, of asthma," &c.

"6. Nor that the same individual function is augmented or diminished to a fatal degree by certain poisons.

"7. This series of facts has not been duly associated and shown to belong to *one* particular *order*.

"8. The principle of action in this order of facts has not been demonstrated to be at once excited and reflex, in its operations, to be essentially connected with corresponding portions of the *medulla oblongata* and *medulla spinalis*, and to be independent of the brain.

"9. Nor has it been clearly distinguished from the other sources and principles of muscular motion existing in the animal economy, viz. volition, the motive influence of respiration and irritability, or shown to constitute with the irritability, the principle of life in the fœtal state.

"10. The reflex function appears, in a word, to be the *complement* of the functions of the nervous system hitherto known."—P. 666.

From these extracts, with the analysis already given, our readers will be enabled to understand what Dr Marshall Hall means by the Reflex Function of the Spinal Chord. The whole amount of the inquiry is, that he adopts a new method of explaining several phenomena evinced by the motions of the muscular system, which had been long observed and well known. The only question comes to be, whether the method of explanation is accordant with the phenomena, and consistent with the true principles of philosophical inquiry.

Now we do not deny that this assumption of a Reflex Function or property in the spinal chord explains, with a reasonable degree of verisimilitude and success, all those phenomena which we have already said, have been attributed by Bellingeri to the principle of Nervous Antagonism. But we must be permitted to observe, that the doctrine of a Reflex Influence rests on very uncertain ground; and to say further, that the whole doctrine of an influence moving from one point of the nervous system to another, of which this hypothesis of a retrograde influence is part, is indeed nothing but a gratuitous assumption from beginning to end. This idea, indeed, of nervous influence or energy, or whatever denomination it receives, being either generated in one part, or transmitted from that to another of the nervous system, is nothing but a remnant of the old mechanical hypothesis of animal spirits, and has no better evidence of its existence. All the phenomena ascribed to its transmission might be equally well explained without it; and its assumption, instead of affording facilities for instruction in the philosophical theory of the functions of the nervous system and the laws by which these functions are regulated, has contributed to throw the whole of the facts into the greatest confusion, disorder, and obscurity. By applying to vital phenomena, and properties regulated by physiological laws, ideas derived from the physical world, and founded on mechanical principles, physiologists have only rendered these vital phenomena more familiar to the grossness of their conceptions, but have not made any step nearer to the true elucidation of the actual functions of the nervous system. They have coined many words, but have not fabricated a single new idea.

This predominant idea of nervous influence *moving from* one part *to* another has been the most fertile source of error in the investigation of the properties of the nervous system, and will continue to constitute the great impediment to real progress in this inquiry. Is there any proof of its existence, we beg to ask? Is there any necessity for supposing such a principle, or the motion of such a principle, through the nerves? What is the rate of its motion through these chords? Were this the proper place, it would not be very difficult to show that there is no ground for believing in such a principle,—that its motion is an extreme absurdity,—and that the nerves may perform all that is required of them, by merely maintaining the communication between remote parts of the system, and controlling or regulating the irritability of the muscles. That this is the mode in which the function denominated *reflex* by Dr M. Hall is to be understood, we would submit to all unbiassed inquirers on this point. It is clear, we conceive, that one use of the nervous system is to maintain a degree of control over the property of irritability in the muscles; and it appears also pretty clear, that when the nerves or their cerebro-spinal extremities are so much injured as to be unable to exercise this control, the muscular motions begin to evince irregularity. Some of the phenomena enumerated by the present author appear to belong to this head; and all of them may be explained with perfect facility by means of the theory of Nervous Antagonism explained by Bellingeri.

In making these observations, we do not wish it to be understood that we undervalue the researches of the present author. His memoir evinces much originality and ingenuity, and will be carefully studied by all those who take pleasure in the progress of physiological inquiry, and especially that department which relates to the elucidation of the functions of the nervous system.

Art. VIII.—*A Synoptical View of the Diseases of the Chest, as Illustrated either by Auscultation, Percussion, Thoracic Measurement, and Succussion, or by other sources of Information.* By Richard Maddock Hawley, M. D. Fellow

of the Royal College of Physicians, Edinburgh, &c. Edinburgh, 1834. Imperial folio, pp. 6.

THIS excellent and perspicuous synoptical classification of the diseases of the chest, and the modes of diagnosis appropriated to each, we notice principally for the sake of the clinical student and the junior practitioner, to whom Dr Hawley has here rendered a great service.

Every one conversant with the management of cases of this class, knows how difficult it is to apply all the diagnostic signs with their proper restrictions and conditions, so as to establish a good diagnosis; and it is neither convenient nor always practicable to have the volume of Laennec at the bedside of the patient. By attending, however, to the distinctions made by Dr Hawley in this Synopsis, the student will find, that he can with greater facility than by most other means, study the method of recognizing the presence of the several diseases of the thoracic organs, and of tracing the changes which they progressively undergo.

The arrangement is clear, and the distinctions are delivered with the precision of thought and expression in which Dr Hawley has been long well known to excel. It is almost unnecessary to say, that, while it will be most useful to the advanced student, it will prove a great assistance to all who wish to obtain precise ideas on the best mode of distinguishing the presence of diseases of the heart and lungs.

ART. IX.—*Illustrations of the Effects of Poisons.* By GEORGE LEITH ROUPELL, M. D. The Plates from Original Drawings by ANDREW MELVILLE M'WHINNIE, M. R. C. Surgeons. Part II. London 1834. Four Coloured Engravings.

THE present part of this valuable work contains four coloured engravings, illustrating the effects of sulphuric acid, oxalic acid, corrosive sublimate, and strong alcohol on the mucous membrane and other tissues of the stomach.

These effects are represented with great accuracy and fidelity. There is, indeed, in some parts a degree of high-colouring; but for this we can make allowance,—being aware that the colours of morbid or otherwise injured parts are invariably much more vivid immediately after death than in the course of some days, —and also that it is no easy matter for the artist always to seize the exact colour in a drawing of such parts.

With the allowance now made, these figures form valuable records of the effects of the corrosive poisons on the gastric tissues; and we have no doubt, that, if Dr Roupell proceeds as he has commenced, he will render a very great service to the pathological department of legal medicine. As it is of much moment that this species of information be extensively diffused among medical and surgical practitioners, we trust that Dr Roupell will proceed steadily in his undertaking.

Art. X.—*A Demonstration of the Nerves of the Human Body.* By Joseph Swan, London, 1834, 4to. Pp. 98. lxxxii.

The present is a small and less costly edition of the magnificent work of Mr Swan completed some time ago, and which we have already recommended in strong terms to the attention of the anatomical and physiological part of the profession.

It is almost superfluous to advert to the reasons which Mr Swan assigns for the publication of this edition, or to specify the advantages which a small form of a work so extensive and costly must afford. It is sufficient to say, that it appears, that, if Mr Swan had not himself published his Delineations of the Nervous System in the present shape, some other party would have undertaken that duty for him, to his great detriment, both in character and in finances. A threat of publishing surreptitiously the large work in a small and cheap form, or, as it is sometimes denominated, of pirating the work, was made; and there was no alternative but for Mr Swan to anticipate this benevolent hint, and gratify the taste of those who were desirous for such a form of publication. In this Mr Swan has also consulted their interest; for it cannot be doubted that the work is published in a much more accurate form than it could have been, had it been left to the tender mercies of those, who wished merely to make of it a pecuniary advantage.

In recommending the present edition, which we do very strongly, and on the ground that it merits a strong recommendation, we must remind our professional friends that Mr Swan really makes a great sacrifice by the present measure. The quarto copy is in all respects, except the size of the engravings, quite as good as the imperial folio edition; and, therefore, no person who wishes to possess the book, independent of this single circumstance, of magnitude of object, who can procure the small edition, will go to the expence of the large one. Every copy of the small edition, therefore, is exactly one fewer of the large; which in this manner may be rendered nearly useless, unless as an object of curiosity.

On the other hand, however, it is likely that the smaller and less costly form of the work may tend to render its circulation more extensive; and we trust sincerely, that as Mr Swan deserves this remuneration, he will not fail to receive it.

PART III.

MEDICAL INTELLIGENCE.

ANATOMY AND PHYSIOLOGY.

On the Structure and Functions of the Skin.—At the sitting of the Royal Academy of Sciences, on the 27th January, M. Breschet read a joint memoir on the skin by himself and Dr Roussel. The parts of the skin to which these authors called the attention of the Academy were the *dermis*, the nervous *papillæ*, the apparatus for the secretion of the sweat, the absorbents, the organs which produce the horny matter (*appareil keratogène*) and the organs which produce the colouring matter (*appareil chromatogène*). The following are the conclusions which they endeavour to establish. 1. There exists in the skin an apparatus for the secretion of the sweat, composed of a glandular *parenchyma* secreting the liquid, and of canals which open outwards. These excretory canals are disposed in a spiral direction, and open very obliquely under the scales of the *epidermis*. 2. The organs of absorption differ in some respects from the lymphatic vessels, with which they seem to communicate. These organs appear in the form of transparent canals, of great fragility, branching out, and forming little creeks of communication with each other, on which, however, it is impossible to recognize any orifice,—any terminating mouth, which might serve for absorption; a circumstance which leads the authors to think that this function cannot be executed by a species of secretion, but rather by imbibition, or by a mechanism analogous to that of endosmosis. 3. The medium on which these canals are stretched is a substance highly hygrometical, through which the phenomena of absorption takes place. 4. The papillary bodies are truly nervous, and the nervous filaments which enter into the composition of each papilla do not terminate by forming a pencil (*pinceau*,) where each fibre would be free and isolated, but the nervous ramuscles appear to form terminal arches. 5. These papillæ are enveloped in a peculiar membrane, and in a layer furnished by the epidermic horny substance. 6. Blood-vessels penetrate also the *papillæ*, but their volume is less than that of the nervous filaments. 7. The different horny epidermic layers constitute a peculiar apparatus, composed of an organ of secretion, and of a product disposed in fibres at first perpendicular to the dermis, but afterwards becoming horizontal. These fibres or little stalks result from the superposition of minute scales, and the *epidermis*, properly so called, is only that part of those stalks which is the farthest removed from the skin. 8. In this epidermal substance formed of scaly layers, the absorbing canals and nervous *papillæ* found are spread out. 9. Independently of the apparatus for the secretion of the epidermic horny substance, there exists in the integuments towards the external surface of the *derma* a small apparatus for the secretion of the colouring matter.

On the Evolution of the Thymus Gland in Man. By Dr HAUGSTED, (*from the Archives Generales, November* 1833.)—The first traces of the *thymus* appear in the human embryo towards the ninth or tenth week of pregnancy. Burdach makes it arise from the ramification of the vessels coming from the neighbouring parts. At the ninth week, there are found behind the superior extremity of the *sternum* two small corpuscles separated from each other, which become more distinct about the tenth week, and the inferior extremity of which is united by cellular tissue. Growing by little and little downwards, their volume is almost equal to that of the lungs, though at this period they do not acquire, in proportion to the size of the body, so considerable an increase as they do at a later period. Cooper, and those who have copied from him, were wrong in affirming that at two months the *thymus* is larger than at any other period in proportion to the whole size of the body,—an error the more serious, that in the human embryo of this age the most scrupulous researches have failed to discover the least trace of the *thymus*.

If the human *fœtus* of three months be examined, the *thymus* gland will be found small, situated on the base of the heart, and enveloped in yellowish cellular tissue. It consists at this period of life of two granulations situated on the sides of the *trachea*, and is very small in proportion to the other organs of the chest.

At the fourth month the *thymus* is more developed, and, resting on the base of the heart, extends to above the clavicular region. The two lobes which constitute it are then plainly perceived, and their granular structure easily seen by the naked eye.

At the end of the fourth month, the developement of the *thymus* is still more considerable, and its two lateral halves are more intimately connected. Wrisberg thus describes the *thymus* of a *fœtus* of five months and a-half. "This organ is composed of two great lobes, and a small *succenturiated* lobe. The superior lobe of the *thymus*, resting on the left subclavian, is loosely attached to that vessel; the inferior adheres more intimately to the superior part of the *pericardium*; and the small lobe representing a large sympathetic ganglion adheres to the right subclavian artery for the extent of two lines."

In a *fœtus* of six months, Dr Haugsted has seen the *thymus* elevated to the thyroid gland. He was not able to determine, whether before that age the *thymus* contained any juice or not, because none of the younger *fœtuses* which he dissected were fresh, but had all been preserved for a longer or shorter time in alcohol.

In a *fœtus* of seven months which he dissected fresh, the *thymus* had acquired considerable bulk, the juice which it contained was in less quantity than in a *fœtus* at full time, but sufficiently abundant to enable him, by cutting and squeezing the glands, to produce some drops. On a careful examination, its cellular structure might already be recognized.

From that period the *thymus* continues to increase in size till the full period of pregnancy, but its specific weight diminishes in proportion as its cells are formed, so that while at eight months it is 1.099, at nine months it is only 1.071.

In the *fœtus* at full time, and in the new born infant, the figure, situation, and structure of the *thymus* are such as Dr Haugsted has described them to be in his Treatise on the Anatomy, Pathology, and Physiology of this body, published at Copenhagen in 1832. The bulk varies considerably. In some small lean new born children, he has seen it weigh scarcely a drachm, while its weight exceeded half an ounce in others which were larger, better nourished and full of juices. In the number of still-born children examined by him at the Lying-in-Hospital, there were scarcely two in whom the *thymus* was of the same size, though the greater number weighed two or three drachms. This is less than what is stated in books of anatomy.

There are some anatomists of reputation, who assert that the *thymus* at the full time of pregnancy has acquired its greatest size, that becoming useless at birth, it begins after that to decrease, and exists no longer in childhood. The most exact observations, however, show that the *thymus* does not lose its volume in the first age, but, on the contrary, grows with other parts of the body, at least till the age of one or two years. In some children but not in all, the sides of the *thymus* are compressed in respiration, and it loses in its dimensions from one side to another, but its diameter is at the same time augmented from before backwards. If, then, on opening the chest of an infant, this organ appears at first sight less bulky than in the *fœtus* at full time, a more attentive examination will demonstrate that it has really increased.

The changes which the *thymus* undergoes after the first or second year are of two kinds, and are naturally referred to two periods.

From the second year till the eighth or tenth, and consequently, from the termination of the first dentition till the evolution of the permanent teeth, the *thymus* appears neither to gain nor lose in size. Its cellules, however, are gradually obstructed, the humour which is there contained diminishes, and its structure undergoes changes which render it unfit for its functions, whatever they may be. But though it thenceforward appears to be a useless piece of the organization nourished by its own vessels, it still continues to be endued with vitality.

But though the *thymus* preserves nearly its absolute weight, by these modifications of structure its specific gravity is daily lessened. At birth this was 1.071. In an infant fourteen days old it was only 1.02, and in a child of ten years of age it was scarcely equal to that of water. If we consider the *thymus* gland in regard to its dimensions, it will be found to cover with its inferior horns the base of the heart, and to extend from the middle of the third rib to the inferior part of the neck above the clavicles; at least such was the case in a boy ten years old, and a girl of the same age. The *thymus* at this period still presented distinct traces of its cellular structure.

It is after the appearance of the permanent teeth that the appreciable decrease of the *thymus* commences. Its vessels diminish; its cellules are obliterated; it is more solid; less moist; its substance appears to be absorbed: and its lobes are attenuated and separated. Till twelve years of age these changes are scarcely perceptible, but the progress after that is rapid till the sixteenth year. The *thymus* no longer presents traces of its granular structure, or of its division into lobules. Each of its lobes, separated from its fellow, resembles the thyroid body, or rather the spleen. A great quantity of fat usually fills the cellular tissue which surrounds it, and that which penetrates its lobes. From the sixteenth year its decrease proceeds more slowly till it be completely atrophied, and nothing but slight traces remain. The atrophy commences at its inferior portion, but its superior portion afterwards decreases, so that its remains in the adult are found at the superior part of the chest, behind the extremity of the *sternum*. When its substance has disappeared, there remains in its place an adipose mass containing some brownish corpuscles, the last traces of the existence of this organ. Dr Haugsted rejects, therefore, the opinion of Meckel, Burdach, and Hewson, who assert that after twelve years no traces of the *thymus* are to be found, in opposition to Cooper, who assures us that he never dissected a subject, however old, in which he did not find the remains of this organ. In the body of a young man, twenty-one years of age, examined by Dr Haugsted, the remains of the *thymus*, atrophied and enveloped in fat, were distinctly seen. It was separated as exactly as possible, and was found to weigh nearly two scruples. It was not so large in a woman of the same age. In another young man of seventeen, it weighed a drachm and a-half.

The age at which the last traces disappear is very variable. Dr Haugsted has found sufficiently marked traces in subjects thirty years old and upwards. In other instances, on the contrary, of twenty-six and twenty-eight, with difficulty he found some traces in the midst of the fat cellular tissue which occupied the place of the *thymus*. Thus, unless we choose to give the name of remains of the *thymus* to the cellular tissue, he does not conceive that Cooper could affirm that he had never met with a subject, however old, in which this organ was not to be found. A statement not less destitute of foundation is that of H. Caldani, who asserts that the *thymus* does not disappear in the adult, but that it remains and divides into several glands, which may be filled with mercury, by injecting the lymphatic vessels of the liver. Dr Haugsted has frequently met, he acknowledges, with lymphatic ganglions in the cellular tissue, which occupies the place of the *thymus*, and that not only in man, but in different *genera* of the mammifera; but these ought not to be confounded with the remains of the *thymus* gland. They are true lymphatic ganglions found in the *fœtus*, and in the new born infant, at the period of the greatest developement of the *thymus* in the cellular tissue surrounding it, and they preserve their integrity when it has disappeared.

To convey a just idea of the different proportions of the *thymus* at different ages, the following table is given of its dimensions and weight at different periods of the life of the *fœtus*, of the child, of the youth and the adult, from which the laws of its evolution may be deduced. All those, the weight of which is mentioned, were dissected in a fresh state.

Age.	Length.						
	From mouth to anus	From crown to heels	Weight	Length	breadth	Thick.	Weight
	Inches.	Inches.					
Human fœtus of 10 weeks,		2½		¾ line.	1-5th	¼	
Do. male, 3 months,	2	4		2½ to 3	1¼ lines	½	
Do. do. 4 do.,	3	5½		3 to 3½	1½	¾	
Do. do. 5 do.,	3½	6		5	2	about 1	
Do. do. 6 do.,	6	10		1 inch.	3 to 6	1½	
Do. do. 7 do.,	7	13	3½	1½ inch	5	2 to 3	33 gr.
Do. do. 8 do.,	8½	14½	2¾	1 in. 6 l	½ inch	3 lines	40 gr.
New born female infant well nourished, - -	11	20	9	1½ to 3	1 to 2	2 to 4 l.	240 gr.
Do. male do. small and lean,	9	17	5	1 4-5th	½ to 1½	2½ lines	84 gr.
Male infant, small and lean, 4 weeks, - -	10	19	6	2	7 to 9 l.	2 lines	120 gr.
Do. well nourished, 9 months,	11	23	11½	2¼	1½ in.	4 lines	270 gr.
Do. scrofulous, 10 years,		48		2½ to 3	1 in.	1½ lines	110 gr.
Emaciated scrofulous girl, 10 years, - -		46		2 to 2½	7 lines	1 line	30 gr.
Lad of 17 years, -				1¾	¾ in.	¼ inch	90 gr.
Girl of 21 do., -							40 gr.

On the Shortening of the Vertebral Column after a long march. By M. Chassaignac.—(*From the Archives Générales, March* 1834).—In a paper on some parts of the anatomy, physiology, and pathology of the vertebral column, M. Chassaignac proposes what he considers a new explanation of the shortening of the spine after a long march. Physiologists have in general explained this by what they supposed to be a sinking down from compression of the intervertebral substances, which during repose would return to their primitive state, by a species of slow resilience. This explanation, in which an absolute diminution of the length by sinking down of the substances is admitted, appears to M. Chassaignac both somewhat paradoxical and destitute of foundation, since he is convinced by direct experiments, that pressure exercised in a vertical direction, on the vertebral column, can diminish the length only by increasing the curvatures, and not by absolutely depressing the intervertebral discs. Thus the pulpy substance occupying the centre may be considered a sort of pivot, a liquid *point d'appui*, on which the *vertebræ* play. This appears to partake of the incompressibility of liquids, which is quite incompatible with the idea of the absolute diminution of the length of the discs, but quite reconcileable with the opinion, that the increase of the curvatures causes the shortening. It is the same in this case as in rickety patients. The vertebral column, as M. Cruveilhier has demonstrated, presents for the most part no absolute, but only an apparent, diminution of length depending on preternatural inflexions.

CHEMISTRY, MATERIA MEDICA, AND PHARMACY.

On the presence of an Aromatic substance in Urine, analogous to Musk. By A. Chevallier. (*From the Journal de Chimie Medicale, March* 1834.)—Among the singular phenomena which presented themselves to M. Chevallier while engaged in the examination of the urine of different patients, he remarked the presence of an aromatic substance analogous to musk.

In three cases this was observed; 1*st*, in the urine of a man treated by M. Andral, the younger, for arthritic pains; 2*d*, in that of a lady labouring under *pneumonia*; 3*d*, in that of a student of pharmacy. In none of these cases had the individual used musk. In the first two cases the urine had a very marked odour of musk. Submitted to distillation, it furnished an aromatic liquor possessing the odour of both urine and musk. The former disappeared at the end of a few days, leaving the latter alone perceptible. This odour continued for several months. In the third case, the individual found occasionally that his urine had a light agreeable odour, which he compared to that of musk. This occurred in various circumstances, but especially after exercise. In these cases the urine possessed more odour in the evening than in the morning, and making water was preceded by rather acute pains in the kidneys. The patient had never swallowed musk, and he had not touched it while the phenomena appeared. M. Chevallier has met with the odour of musk in a small uric acid *calculus* examined by him; but this is the only instance in which he has met with it in upwards of 200 calculi which he has examined.

It is probable that musk may, in certain cases, be produced in the animal economy, in consequence of morbid alterations. The odour of this principle has already been recognized in the bile, and some of the other products of animal nature; and it is probable that it is further produced in other circumstances.

It may be here observed, that cow-houses almost invariably exhale a musky odour; and that it is not at all improbable that this depends on the presence of some musk-like principle in the urine of the cow.

New method of preparing Creosote. By M. Calderini, *Apothecary at Milan.*—The essential oil obtained by the destructive distillation of wood is to be put into an iron vessel, and exposed to a gentle heat. The vessel is then to be taken from the fire, and slaked and sifted lime to be poured into it little by little, and with continual agitation, until the effervescence ceases, and the mixture becomes a hard mass, which is to be allowed to cool, and then powdered. A cast iron retort is to be two-thirds filled with this powder, and placed in a reverberatory furnace. A receiver is to be fitted to the retort at the moment when the white vapours which first come over become yellowish. The distilled liquid is to be placed in a filter of paper moistened with water, to permit only the aqueous part to pass, and the oil left is to be washed with pure water, which is to be allowed to filter. The oil thus washed is to be placed in an iron vessel and *aqua potassæ* of sp. gr. 1.125 is to be added in the proportion of three parts to two of the oil. The mixture is then to be boiled for a moment with a gentle heat, after which it is to be taken from the fire, allowed to cool, filtered and mixed with dilute sulphuric acid, till it becomes slightly acid. The mixture is then to be left at rest, and an oily matter will be found floating on the top, which is impure creosote. This is to be collected, washed on a filter, put into a glass-retort placed in a sand-bath, and distilled. The first portion is to be laid aside, and what comes over afterwards of a pale yellow colour when heat is added is creosote. The distillation is to be stopped when the drops become of a deeper colour. If the distilled creosote be not sufficiently pure, it is to be dissolved anew in the *aqua potassæ*, and treated as before, always rejecting the first and last parts that come over on distillation, and this process is to be repeated until it becomes perfectly pure. When the creosote is obtained pure it is to be kept in well-stopped bottles. It is known to be pure when it is colourless, transparent, of specific gravity 1.037, and possessed of great refrangibility. If a drop be placed in contact with the white of an egg, it is suddenly coagulated. If it be dissolved in a small quantity of *aqua potassæ*, the solution, when heated in contact with the air, does not assume a brown colour, as happens when the creozote is impure, but becomes slightly reddish.

On Valerianic Acid and its Combinations. By M. TROMMSDORF.—*(From the Journal de Pharmacie, May* 1834.*)*—M. Trommsdorf is convinced, that the acid discovered by Peutz in water of valerian, and which had been considered as acetic acid, is a peculiar acid, endued with the following properties.

It is a colourless, limpid, and oleaginous liquid. Its odour is very analogous to that of the root of valerian and its essential oil, differing from it, nevertheless, and more disagreeable. It is diminished when the acid is combined with a base, but it never entirely disappears. The taste of this acid is extremely repulsive, and the peculiar sensation which it produces on the tongue remains there a long time. If the acid be much diluted, it leaves a sweetish after-taste, like sugared water. The specific gravity of the oily acid at 26.″6‴ of pressure, and at 10. C. (50 Fahr.), is 0.944. It remains liquid at — 21 (—7 Fahr.) It burns without leaving a residuum, with an intense flame, and boils at 182 (392 Fahr.), under a pressure of 27″.6‴. It dissolves in 30 parts of water at 12 C. (54 Fahr.) Alcohol dissolves it in all proportions; but the essence of turpentine does not appear to dissolve it. Acetic acid, concentrated to the density of 1.07, dissolves it rapidly, and in great quantity. Sulphuric acid renders it yellow when cold, and carbonizes it with disengagement of sulphurous acid when hot. Fuming nitric acid acts with difficulty on it, even when they are distilled together at several trials. The valerianic acid is prepared by agitating the essential oil of valerian with carbonate of magnesia and water. On distillation, an oil passes over which is no longer acid, and of which the odour is less powerful than the primitive oil. Sulphuric acid is then to be added to the liquid which remains in the retort, and the distillation renewed. The water of valerian may also be saturated with the carbonate of soda, and the concentrated solution be decomposed with sulphuric acid diluted with its weight of water. The distilled liquid is formed of two layers, —the one is oleaginous valerianic acid, containing about 30 per cent. of water; the other, a concentrated solution of valerianic acid. The composition of dry valerianic acid, determined by M. Ellemy, is as follows:—

In atoms.	In hundredths.
10 C = 764.37	64.96
18 H = 112.31	9.54
3 O = 300.00	25.50
1179.68	100.00

The oleaginous acid, when dried as much as possible, appears to retain H_2O more than the dry acid.

The valerianates present the following properties:—A peculiar odour, a sweet taste, with a sharp after-taste. They are efflorescent, deliquescent, or unalterable in the air. They crystallize with more or less facility, they are unctuous to the touch, and more or less soluble in water. Heat decomposes them, and disengages at first a portion of acid without alteration. Strong acids separate the valerianic from its combinations, and this acid in its turn decomposes the benzoates and the carbonates.

On the Physiological and Therapeutical effects of **Digitalis Purpurea.** By M. Joret, D. M. P., *(from the Archives Generales* for January and March 1834.) M. Joret has considered at great length the comparative merits of the various preparations of digitalis in use on the continent, its action on the system, and its influence over disease. We give briefly his conclusions.

I. *On the choice of preparations.*—1. That the powder of *digitalis* being capable of being administered to the extent of twelve or eighteen grains, beginning with one grain and increasing the dose each day, without producing in the greatest number of cases well marked affections of the digestive functions, may be managed easily without fear. 2. That the watery extract of *digitalis* may be exhibited in larger doses than the powder without being followed by any irritation of the digestive canal. 3. That it produces always results as favourable and in as short a space of time as the powder of *digitalis*, and ought consequently to be .preferred. 4. That the alcoholic extract of *digitalis* is a medicine on the effects of which we cannot reckon, and which, consequently, ought rarely to be used. 5. That the etherial extract is the least to be depended upon, and ought to be banished from therapeutics. 6. That the etherial tincture acts most frequently by the *menstruum*, and not by the solvend. 7. That the infusion, the most active preparation, containing the greatest quantity of digitaline, ought to be administered, beginning with twelve or fifteen grains, and increasing the dose according to the gastric susceptibility of the patient. 8. That the dry plant ought to be preferred to the fresh leaves.

II. *On its physiological effects.*—1. That in the great majority of cases, *digitalis* exhibited in powder, as a watery extract, or as an infusion, acts as an irritant on the digestive organs, and the gastro-intestinal irritation thus produced is always denoted by *colic-diarrhœa*, nausea and vomiting, and is the more dangerous that it appears at different intervals, and after different doses. Thus violent *diarrhœa* has followed a dose of three grains of the powder, while in other cases thirty-six and sixty-five grains have been taken with impunity. 2. That *digitalis* possesses the property of moderating the pulse, which is not prevented by the gastro-intestinal irritation. 3. That it is only in two cases of *phthisis* that the author has observed the pulsation of the radial artery accelerated. 4. That respiration may be advantageously influenced by the employment of *digitalis*, and that most frequently the *dyspnœa* disappears at the same time that the pulse diminishes in frequency. 5. That rarely has any well marked disturbance of the nervous system been observed in consequence of the administration of *digitalis*. This is contrary to the opinion of Dr Sanders, who affirms that *digitalis* in powder causes violent disturbance of the cerebral functions, and that the nature of this action is somewhat similar to that of morphine. Yet the doses exhibited by M. Joret far exceeded those of Dr Sanders. 6. That the hydrogogue virtue attributed to it by many authors is confirmed by the author's observations, and that the facts advanced by M. Trousseau justify the conclusion, that the decoction of *digitalis* applied in the proportion of two to four ounces over the belly is a powerful diuretic, far preferable to the intestinal administration of other diuretics, because it may be employed in every case of gastro-intestinal irritation.

III. *On its Therapeutical* effects.—1. That palpitations of the heart, which are most frequently the prelude of a more severe affection, commonly yield to the use of digitalis. 2. That asthma may be relieved by the employment of digitalis. 3. That *œdema* of the inferior extremities, *ascites* and *anasarca* may disappear under a long-continued use of digitalis, 4. That the success attributed to *digitalis* in epilepsy, *mania*, *hæmoptysis*, advanced *phthisis*, *scrofula*, and many other maladies, is not exaggerated.

On the Employment of Sulphate of Copper in Croup. By Drs Serlo and Malin.—(*From Hufeland's Journal for January* 1834.)—In certain peculiar inflammations, such as croup, the *encephalitis* of infants, and puerperal *peritonitis*, the antiphlogistic treatment alone is not sufficient. Dr Serlo had often remarked that an emetic exhibited at the beginning of croup proved highly salutary. In one case, however, tartrate of antimony twice administered failed to produce vomiting. *Ipecacuanha* is inconvenient in two respects. It is difficult to induce children to swallow it in large enough doses to produce vomiting, and its emetic effect is not certain.

Having been called to a little girl who had been already treated with calomel, leeches, tartrate of antimony, and blisters, the idea struck Dr Serlo of trying the sulphate of copper, recommended by Hoffman in analogous cases. He administered four grains to the child, and five minutes afterwards, several fits of vomiting occurred, accompanied by the expulsion of false membranes, and from that moment the severe symptoms vanished. Since then Dr Serlo has always employed the sulphate of copper, in conjunction with the antiphlogistic treatment, and of forty cases, he has lost only four patients, to whom he was called too late. In the *laryngo-tracheitis* of infants, which resembles croup, the sulphate of copper is no less useful, of which he gives nine instances. He first exhibits as an emetic three grains of the sulphate of copper, rubbed up with six of sugar, and every two hours a powder composed of a quarter of a grain of the sulphate, with five grains of sugar. Dr Malin has met with the same success as Dr Serlo from the employment of the same means.

Homœopathic Experiments. By M. Andral.—(*From the Bulletin Générale Therapeutique, May* 1834.)—M. Andral, at the Hôpital de la Pitié, has been putting to the test of experiment the homœopathic doctrine since November. These experiments are not yet concluded, but we shall give the results as far as they go, which are quite conclusive against the views of Hahnemann. M. Andral treated the patients submitted to homœopathic strictly in accordance with Hahnemann's principles. The symptoms were combated by medicines, the special properties of which were pointed out by the German physician, and which, to insure the greatest exactness, were made up at the establishment of Guibourt, to which the homœopathic physicians send their patients. The regimen was carefully watched, and was altogether in accordance with that recommended by Hahnemann. It was composed of broth without salt or vegetables, of paps or of milk potages, and when the patients could eat, they were allowed bread and wine, meat which had served to make broth, and roast, rarely fish. Vegetables were never given to them, nor was any of their food seasoned. For drink they had sugar and water. During the treatment all external medication was interdicted. It is impossible with all these precautions, not to have sufficient *data* to judge of the doctrine, especially when the facts are so numerous, and the physician so acute. The facts were collected with the most minute attention by M. Vernois, one of the *internes*.

In fifty-four applications of the homœopathic treatment eight patients alone derived any benefit, which continued without the use of any other plan of treatment, and forty-six were as bad some days after the administration of the globules as before. It ought, however, to be mentioned, that the state of seven of them was slightly ameliorated on the morning after they took the medicine. But what were these cases? The first was a case of intercurrent pain, which had existed for some days; the second was a case of *angina*; the third one of rheumatic pains; the fourth, intercurrent cephalalgia in a phthisical patient; the fifth was a case of stunning in a man subject to cerebral congestion; the sixth a case of diarrhœa following constipation; the seventh one of rheumatism at the 18th day; and eighth, a case of a slight pain which came on during chronic *gastro-enteritis.*

The medicines employed by M. Andral, were *aconitum*, *arnica*, *belladonna*, bryony, camphor, camomile, *colchicum*, *ipecacuanha*, *hyoscyamus*, *opium*, soluble mercury, *nux-vomica*, metallic lead, *Pulsatilla nigricans*, and tin.

From the month of January M. Andral treated thirty-five patients on homœopathic principles. Of these, eighteen were men, and seventeen women. Five were submitted to the *aconitum*, four to the *arnica*, five to *belladonna*, five to bryony, one to camomile, three to colchicum, three to hyoscyamus, one to opium, two to soluble mercury, three to *nux-vomica*, one to lead, and two to the *Pulsatilla nigricans*. We throw the results, &c. into a table.

Case	*Medicinal Substance.*	*Disease.*	*Predominant Symptoms.*	*Effects.*
1	Aconitum, 24th dilut.	Gastritis.	Intense fever.	2 pulsats. less in the 24 h. & variola in morning.
2	do.	Intense quotid. fever	Impulse of the heart	None.
3	do.	Acute amygdalitis.	Intense fever.	Lowering of the pulse, & dimin. of the disease.
4	do.	Tubercles.	Frequency of pulse.	Diminution of the pulse.
5	do.	Acute arthritis.	Do.	Severe headach.
6	Arnica, 6th dilut.	Pulmon. tubercles.	Violent stunnings, (*violens etourdissemt.*)	None.
7	do.	Cerebral congestion.	Strong stunnings.	The patient declared himself immed. relieved.
8	do.	Dropsy of pericard.	Stunning & vertigo.	None.
9	do.	Dysmenorrhœa and chronic gastritis.	Most inten. headach	No immediate effect, amelioration, 3d day.
10	Belladonna, 24th dilut.	Hemiplegia.	Disturb. of vision.	None.
11	do.	Bronchitis.	Obstinate cough.	Do.
12	do.	Do.	Do.	Do.
13	do.	Affect. of optic nerve.	Considerable disturbance of vision.	Do.
14	do.	Affection of heart.	Stunning.	Do.
15	Bryony, 30th dilut.	Intermittent fever.	Wandering pains.	Do.
16	do.	Hypertro. of heart.	Severe pain in the *epigastrium.*	Do.
17	do.	Acute arthritis.	Pain in the shoulder	Do.
18	do.	Pleurodynia, bron.	Cont. fits of coughing	Do.
19	do.	Chron. gastro-enter.	Severe pain in left knee and shoulder.	Do.
20	Colchicum, 15th dilut.	Acute arthritis.	Severe pain, with redness and swel. of the two wrists.	Diminution of the pains.
21	do.	Lumbago.	Viol. pains in loins.	None. Patient was bled.
22	do.	Pulmon. tubercles.	Not on the left side	Diminution of pain.
23	Hyoscyam. 12th dilut.	Do. do.	Violent cough.	None.
24	do.	Bronchitis pleuritis.	Do.	Do.
25	do.	Bronchitis.	Do.	Do.
26	Soluble mer. 6th dilut.	Mercurial tremb.	Of the superior and inferior members.	Do.

27	do.	Syphilis & ulcerats.	Of glans.	Do. Ulceration increased, destroyed frænum, and was stopped only by mercur. oint.
28	Nux vomica, 24th dilut.	Dysmenorrhœa and chronic gastritis.	Severe difficulty of breathing.	Do.
29	do.	Do.	Dyspepsia.	Do.
30	do.	Amenorrhœa.	Desire of vomiting.	Do.
31	Pulsat. nigr. 24th dilut.	Chron. gastro-enter.	Darrhœa.	More sensible.
32	do.	Chronic gastritis.	Colics & Diarrhœa.	None.
33	Camomile, 12th dilut.	Diarrhœa	Without Colic.	Do.
34	Opium, 6th dilut.	Affect. of the uterus, and of the heart.	Obstinate constipat.	Do.
35	Metal. lead,	Obstinate constipat.	For eight days.	Do. The constipat. yielded to purgatives.

From the above facts, it would appear that the homœopathic plan of treating diseases is totally inert, and can be useful only as a *placebo* to hypochondriacs and nervous women, by relieving them from swallowing the manifold drugs with which they think it their duty to burden their stomachs.

On the Cure of Neuralgia by Distilled Cherry-laurel Water. By Dr L. Bloglia dal Persico. (*Annali Universal. de Med. July* 1832.)—Ten cases are brought forward in support of the author's position, that distilled cherry-laurel water is an application which is capable of curing neuralgia. The cases had all been previously treated in the usual way, but in vain. A few applications, however, of the cherry-laurel water were sufficient to alleviate the pain.

Dr Bloglia comes to the conclusion, 1*st*, that it is the most simple curative means; 2*d*, that its application is very easy; 3*d*, that it is not attended by any accident; 4*th*, that the effect can be so much better appreciated as the remedy is single; 5*th*, that it is very economical; 6*th*, that the preparation is easily procured; 7*th*, that its action is not only efficacious in most cases, but, besides, the patient is not liable to relapses.

The strength of the liquor is not given.

Though it is highly probable that the efficacy of cherry-laurel water has been exaggerated by Dr Bloglia, is it worth while putting it to the test of experience here, more especially as if it were of no service, the application could not injure the patient.

PATHOLOGY.

On Angina Coriacea, and its Treatment. By M. E. Gendron. (*Archives Générales, November* 1833.)—This affection, described under the titles of *Palato-pharyngitis, Angine couenneuse, Angine pseudo-membraneuse, Angine pultacèe, Angine caseiforme,* and plastic *angina,* is of the same nature as croup, consisting, like it, of a species of inflammation, attended with the production of false membranes.

The one, however, must not be confounded with the other; as, though the species be the same, the seats of the disorders are different. Dr Gendron, in a memoir published in the *Archives Générales,* after noticing the views of Home, Royer-Collard, and Bricheteau, Louis, and other writers on croup, acknowledges, that at one time he was of opinion, that there were numerous essential differences between the two diseases, but that new observations have caused him to alter his opinion.

Sometime before the publication of Bretonneau's treatise on malignant *angina,* to which he gave the name of *diphtheritis,* M. Gendron made known to the Medical Society of Tours, the advantage which attended the topical application of the nitrate of silver in *Angina coriacea;* a practice which he was led to adopt by a consideration of M. Bretonneau's success in cauterising with hydrochloric acid the membranes affected with croup. On the affection for which he conceives this treatment to be so efficacious, he has still further reflected; and the results of his reflections and observations we now lay before our readers.

The epidemic *angina* which reigned in the canton of Château-Regnault presented this peculiarity, that in this town the sore throat existed without complication or coincidence of scarlatina; whilst in the towns six or twelve miles distant, the two diseases existed simultaneously in many individuals during the first three months of its appearance. From the different symptoms observed during its prevalence, M. Gendron divides this epidemic into two distinct periods.

In the first, the disease appeared in the country complicated with scarlatina, and raged particularly among children.

In the second it attacked, indiscriminately, children and adults, but more particularly the latter; and the *exanthema* became more rare.

At the first period among children, the *pharynx* was found injected, the tonsils swollen, and the *uvula* inflamed; some whitish points like little aphthæ lined the inferior part of the *pharynx*, the tonsils, and the *uvula;* at a later period, that sort of aphthæ increased, and invaded, under the form of white pellicles, all the *pharynx*. The mouth was filled with a viscid matter, the breath became fetid, deglutition was impracticable, and frequently liquids returned by the nose; the Schneiderian member secreted mucous matter; respiration was difficult and whistling, and the voice was nasal; anxiety, a desire of frequently changing place, and of going into the open air, as it were, for the purpose of breathing more freely, appeared, cough ensued, and the little patient soon perished. Called sometimes at the beginning, M. Gendron saved several children, by arresting the rapid progress of the symptoms; but frequently art was unavailing, though treatment was adopted in the first moments of the disease.

At the second period of the epidemic, which it is M. Gendron's object especially to discuss, the *angina* attacked adults in preference. In some he observed slight shivering, fever more or less strong, and vomiting. But in all, the local symptoms were at first, difficulty of swallowing and pain in the *pharynx*, which, however, shows nothing remarkable. In less than twelve hours the symptoms are aggravated; then redness, more or less vivid, in the *pharynx*, tonsils, and *velum-palati* appears, and small white membranes are developed, which successively invade the tonsils, *uvula*, and *pharynx*. The false membranes frequently commence on the tonsils, and then extend one after the other, becoming black in some places, and exhibiting an appearance which is called gangrenous. It is undoubtedly this form of the disease which has given it the name of Gangrenous *Angina*, though what the author of the treatise on *Diphtheritis* calls by this name is a variety of *Angina coriacea*, commencing in the back part of the mouth, and extending to the air-passages, with a train of severe symptoms.

At a more advanced period of the disease, some patients preserve the power of swallowing with sufficient ease, while others can, with difficulty, take a little liquid. Most of the patients have sunk, some with symptoms of slow *asphyxia*, others with symptoms of cerebral congestion.

It is very difficult to determine the special nature of this disease, which accounts for the difference of opinion on the subject. M. Gendron conceives, that at first there are only the ordinary characters of inflammation, then redness and swelling of the tonsils, which are the principal seat, or, at least, almost constantly the origin of the disease.

The apparently trifling nature of the symptoms prevents the attendants from always recognizing the dangerous nature of the affection; and thus assistance is often not requested till the false membranes have invaded the *larynx*. The progress of the disease is then insidious. It is seen developed in catarrhal constitutions, assuming the characters of a cold, and all on a sudden presenting the suffocative symptoms of croup; and commonly more than one have fallen victims to it before it attracts attention. The practitioner cannot too much distrust those slight catarrhs; whether they commence with *coryza*, or slight pain in the throat, and a little difficulty in swallowing, which last symptom, indeed, is sometimes wanting. There are also periods of remission. Sometimes the most frightful symptoms present themselves at night, and disappear in the day; but in spite of this remission, the false membrane continues to extend, at least unless its developement be impeded. M. Gendron has seen in patients whose tonsils he has scarified or cauterised, the first symptoms so suspended as to give ground to hope for a speedy cure; and yet afterwards they presented the symptoms of the third periods,—that is, of laryngeal croup.

M. Gendron asks whether scarlatina, which complicates the disease, has the power of modifying and preserving to it distinct characters, of a nature more decidedly inflammatory.

M. Gendron believes in the propagation of the *Angina coriacea* by contagion.

M. Gendron's experience has led him to adopt the following treatment. If called at the commencement he often applies leeches to the neck, even when little false membranes are formed on the tonsils, provided they be not of long standing. But if the false membranes have existed for some days, acknowledging the inutility of leeches at this second period, he applies the nitrate of silver to the diseased parts. He knows of no means of treatment more efficacious than this. Cauterizing by acids is inconvenient, and is not so efficacious as that by nitrate of silver; and he is confirmed in the use of the latter, by his having frequently used it in syphilitic affections of the throat at the Hospital St Louis.

At the same time that M. Gendron used this method of treating *Angina coriacea*, Drs Mackenzie, Brown, and Balden proved its efficacy in *pharyngitis* and *laryngo-tracheitis coriacea*, terminating in croup. M. Gendron has also more than once convinced himself of the truth of a phenomenon said to be caused by nitrate of silver, to which the attention of physicians was called by the observation of Dr Trousseau, and the experiments of Dr Bennati, viz. the sudden improvement of the voice after the application of the nitrate of silver. Aluminous lotions and the blowing in of the powder of alum are also somewhat useful. In calomel he has little confidence.

At the third period of the disease there is only one chance, and that is the operation of tracheotomy. In the hands of M. Bretonneau it has succeeded four times in twelve; but it is well always to warn the relations of the degree of confidence usually placed in it, that no reflections may be thrown on the operator afterwards.

A Case of Tubercles of the Spinal Chord.—By M. Eager, *Internal pupil of the Hôpital des Enfans Malades, with Remarks by* M. Rufz, *Internal pupil of the same Hospital.*—(*From the Archives Générales de Médecine, April* 1834.)—Jeanne Bliard, aged 13, an apprentice to a maker of artificial flowers, entered the Hôpital des Enfans, 20th February 1833. Her intellectual faculties were highly developed before the disease appeared, and she was of an irascible disposition. The *menses* had not appeared, and she was in excellent health. A year previous to her entrance into the hospital, the disease began with pain, limited to the left side of the head, which appeared without any known cause, and continued incessant for four months without disturbing the intellect either before or after. Eight or ten days after this attack, *cephalalgia*, an embarrassment in the articulation of words, and a very marked kind of stuttering appeared, accompanied with an inclination of the tongue to the left side. About three weeks afterwards, the patient felt for the first time the pain extending to the superior part of the neck, and very soon a weakness appeared in the right superior and inferior extremities, a weakness preceded by some jerking motions in these members, which terminated, in twelve days, in complete *paralysis* of the same. The sensibility, though more obtuse than in the opposite side, was not considerably diminished. M. Eager was unable to ascertain whether the sensibility was increased before the attack of incomplete palsy. The patient complained of formication, and of a sensation of burning heat on the upper and lower extremities of the right side. The least motion of these members caused her to scream. For the first three months she had been obliged to remain in bed; after that the pain having become almost periodical, and the members having gained some power, she walked a little with the aid of a stick, always dragging the right leg, and moving with difficulty the right arm. In about six months a cough, at first dry, and *dyspnœa* appeared. Four weeks afterwards, the cough was more loose, there was abundant expectoration and occasional *diarrhœa*. The cough had not ceased since. On the 1st March, the following symptoms presented themselves, periodical *cephalalgia* of the left side, the intellectual faculties more obtuse perhaps than in a healthy state; no delirium; the eyes very heavy, though not injected; the trunk evidently drawn to the left side; the right eyelid lower than the left; the *ala* of the nose of the right side almost immoveable, as well as the muscles of the right side of the face; diminished sensibility of this side; the tongue inclining to the left side; violent pain in the region of the neck; permanent contraction of the muscles of the right side of the neck, though easily overcome. It was the same with the right superior and inferior extremity; sensibility and motion of this side were considerably diminished, though not altogether abolished, and communicated motion produced much pain. The patient complained of sharp heat, with formication, extending from the neck and right arm, to the sole of the right foot. She lay constantly on her back. Percussion on the chest gave a heavy sound in the supra and infra-clavicular regions. There was cavernous respiration, with gurgling on both sides, on a level with the clavicles, bronchial respiration under the arm-pits, combined with the sibilous wheezing throughout the whole extent of the thorax. Cough was frequent; expectoration dense; pulse small and regular; tongue natural and clean; thirst intense; no pain in the *epigastrium*; slight pain on pressure in the umbilical and iliac regions; abundant and frequent stools, passed voluntary; the same with the execretion of urine; heat of the skin about natural. She remained in this state till the 8th of March, with the exception of considerable fever in the evening. During the night of the 8th of March, great anxiety supervened, with violent pain and vomiting after swallowing a cold drink. In the morning, the belly was found meteorized and painful on pressure, there was great anxiety in the countenance, obstinate *diarrhœa*, and involuntary stools. The pulse was rapid and very hard, respiration irregular and jerking, and there was much sonorous rattle and sibilous wheeze on both sides of the chest. On the 9th the belly was softer, less painful, *dyspnœa* and cough as on the night before, pulse thready. The efforts made to move the right arm and leg caused much pain. In the evening all the symptoms were aggravated, cold sweats, involuntary stools, pulse imperceptible, and death took place at one in the morning.

Inspection twenty-one hours after death.—***Brain.***—The external and superior surface was much injected, and there was distinct infiltration into the subarachnoid cellular tissue. The substance of both hemispheres was healthy. The arachnoid appeared in some places opaque and thickened between the convolutions. The colour and consistence of the *cerebellum* were natural.

Spine.—The external surface of the *dura mater* was natural in its appearance and colour. Two inches and four lines below the furrow which separates the annular protuberance from the *medulla*, the latter was distinctly softened for an inch and a-half in extent. In the midst of this softened tissue there were two softened bodies. The one was rounded, yellow, greenish, offering resistance to the touch, and as thick as a filbert. When cut through the middle, the surface of the cut appeared to be yellow, greenish, slightly granulated, homogeneous, without a concentric layer or appreciable organization. It was six lines in length, and four in breadth. The other, having the same appearance, except that it was elongated and flattened, was placed at the side of the former. They both had a tubercular appearance, and were placed nearer the anterior than the posterior surface. The *dura mater* adhered to their posterior, but not to their anterior surface. Above and below this lesion the appearance of the chord was natural in every respect.

Thorax.—On the right side were found recent false membranes, uniting, though feebly, the *pleura costalis* with the *pleura pulmonalis*; effusion of about fourteen ounces of a sero-purulent liquid, without any remarkable odour, in the right cavity of the chest. The right lung had on its summit a depression corresponding to a cavern. In the rest of its extent there were isolated tubercular masses still hard. In the left side voluminous tubercles were found round a cavern of small dimensions. The heart was somewhat flaccid, and contained in the right auricle and ventricle a fibrinous clot. About three ounces of a lemon-coloured fluid were found in the pericardium, but no adhesions.

Abdomen.—The *peritoneum* was moistened with a large quantity of *serum*, and the external surface of the small intestines presented a very distinct vascular arborescence. The stomach, of an ordinary size, had a papillated appearance, (*aspect mamelonné*,) to the extent of four or five inches, towards its greater curvature. The mucous membrane throughout was extremely pale, and so softened that it was impossible to obtain any where a slip of half a line, except at the pyloric orifice, but there was neither injection nor ulceration. The superior two-thirds of the small intestines presented only small submucous tubercles, scattered, and without injection at the circumference. Towards the inferior third of the *ileum* some red injected patches, and some small scattered ulcerations, were found. In the neighbourhood of these patches the mucous membrane was extremely soft. The *cæcum* was riddled with ulcerations. The mucous membrane had altogether disappeared in many places, especially in the *cæcum*, to the extent of an inch. At those points where it still existed, it was very much thickened and soft. In the colon the same alteration was observed.

M. Rufz, in his remarks on this case, informs us that he has met with fifteen cases of the same kind in the works of Ollivier and Gendrin, and in some theses. M. Eager's case, however, he believes to be the fullest yet given, and it corroborates the conclusions which might be drawn from the others. These are, 1. This species of tubercles is found more frequently in childhood than in any other age. One, however, of the fifteen cases referred to by M. Rufz was that of an old man above sixty.

2. These tubercles are found more frequently in the cervical region than in any other. The tubercles in M. Eager's case were on a level with the fourth cervical vertebræ. In a thesis, however, mention is made of the existence of a tubercle in the inferior swelling of the chord. The state of the mobility of the members appears to be so sure and perceptible an index of the state of the nervous centres, that it may enable us to appreciate the progress of the disease.

The disease dating back a year, we may be sure that before that time the spinal chord was healthy, and that it took a year to develope the two tubercular substances found. But the *paralysis* being complete only for the last eight months, the question comes to be, How is this to be explained? Was it that, during the first four months, the preliminary action could only irritate the chord without producing the tubercles? Or did the *paralysis* not supervene till the tubercle became sufficiently voluminous to compress the end to a sufficient extent? Or, in fine, was the *paralysis* owing to the surrounding softening rather than to the tubercle itself? To none of these questions is a satisfactory answer furnished by the case detailed above.

By its position the tubercle compressed equally the anterior and posterior roots of the nerves arising on a level with it, and the mobility was altered more than the sensibility.

SURGICAL THERAPEUTICS.

Treatment of Erysipelas by Incision.—To the Editor of the Edinburgh Medical and Surgical Journal.—SIR,—As my claims to originality in the treatment of erysipelatous inflammation, by incision, have been called in question, and as it is a practice so uniformly successful, whenever had recourse to in proper time, and according to the directions prescribed in my original paper upon the subject, I shall feel obliged by your giving insertion to the subjoined article in the next number of your valuable Journal, more to benefit the profession and the unhappy individuals who may suffer under this malady, than for any merit there may be attached to, your most obedient humble Servant,

3, *Duchess Street, Portland Place,* A. COPLAND HUTCHISON.
29th June 1834.

In the 14th volume of the Medico-Chirurgical Transactions of London, page 77, in adverting to the treatment of erysipelas by incision, Mr Lawrence says; "Although this practice has been probably adopted heretofore, being incidentally alluded to by O'Halloran* and Pott,† and more directly mentioned by Vogel,‡ we are indebted for its recent introduction into this country to Mr Copland Hutchison, who strongly recommended it in a paper written expressly on the subject, first published in the 5th volume of the Transactions of this Society, and subsequently republished in a somewhat enlarged form, in his Practical Observations in Surgery, second edition."

If this be not a direct attempt, on the part of Mr Lawrence, to take from me the merit of having been the *first* who ever suggested and *practised* such treatment in that disease, I am equally unacquainted with the force of language, or of its tendency.

Upon a reference, however, to the two first authorities quoted, the reader will not find one syllable on the subject, unless, indeed, Mr Lawrence mean to apply the term erysipelas to gangrene and sphacelus; and next, as to the more direct mention of this treatment in Vogel's Handbuch, he will find Mr Lawrence equally unfortunate; for the first edition referred to, and now in the Library of the Royal College of Surgeons in Lincoln's Inn Fields, was published *so lately as* 1820; whereas my original paper was *published in* 1814, in the 5th volume of the Transactions before adverted to, after I had practised the plan of treatment by incision for upwards of five years, antecedently to 1814, in the Royal Naval Hospital at Deal, as my assistants and the numerous medical officers of the navy, then attached to the Scheldt Fleet and Downs station, can now testify.

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* A complete Treatise on Gangrene and Sphacelus. 1765.

† Works 1783, Vol. I. p. 22.

‡ "There can be no doubt that in very acute erysipelas, incisions into the part are more efficacious than any other measure, in giving issue to stagnant fluids, and dispersing the mischief. Attention ought to be paid at the same time to the state of the juices; and suitable internal remedies ought not to be neglected. In this way suppuration and other bad consequences may be prevented."—Handbuch, Vol. iii. p. 358.

Mr Lawrence's error has done me great injury, which I have reason to believe he could not have intended; and it is only now at the eleventh hour I have read with honest pride that *some* of my professional brethren, at least, do really acknowledge me to be the author and originator of this mode of treatment; and among the number is the distinguished Surgeon-General to the Forces in Ireland, Dr Philip Crampton, who, though personally unknown to me, has, in the true spirit of liberality and candour, given me the credit that is due to me.*

It is only within the last eighteen months that I have been enabled to see Vogel's work, so as to satisfy myself of the facts of the case as they are here stated, and to allow time for my friend, Mr Lawrence, to correct the error himself, which, on two separate occasions, when I mentioned the subject to him, he promised to do,—otherwise this correction of Mr Lawrence's error should not have been so long delayed by me.

MISCELLANEOUS.

GRADUATIONS AND SURGICAL EXAMINATIONS.

Medical Graduations at Edinburgh.—On the 1st of August, 1834, the Senatus Academicus of the University of Edinburgh conferred the Degree of Doctor of Medicine on the following gentlemen, in number one hundred and ten, after having gone through the appointed examinations, and defended publicly their Inaugural Dissertations.

Of Scotland.

Thomas Aitkin, De Motu Sanguinis.
John Allan, on Preservation of Health in Hot Climates.
Thomas Graham Balfour, on Tetanus.
Adam Bell, De Erysipelate.
William Bell, on Apoplexy.
John Bower, on Bright's Disease of the Kidney.
James W. Broughton, De Membranis Serosis.
Robert Brown, on Aneurism.
Robert Callender, on Erysipelas.
Neil Stewart Campbell, on Morbus Coxarius.
Alex. M. Cheyne, De Hydrocephalo Acuto.
George B. Cochran, on Bronchitis.
James Duncan, on Empyema.
Robert Flockhart, on Morbus Coxarius.
Arch. Gordon, on Dysentery.
John Hamilton, on Phlebitis.
James Henderson, on Dyspepsia.
Robert Hood, on Asthma.
Robert C. Hope, on Excision of the Joints.
James Hunter, on the Homœopathic Doctrine.
John Hutton, on Fractures of the Leg.
James Inglis, on Pulmonic Emphysema.
John Johnson, on Diabetes.
John Johnston, on Acute Rheumatism.
William D. Kerr, on Phthisis Pulmonalis.

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* Dr Crampton's words are, "The successful management of this disease," (Erysipelas,) I look upon to be the greatest triumph in modern surgery. You all know how much stress I have ever laid on the necessity of early and vigorous measures in the treatment of this affection; and I trust that the present case will add one more to the many successful cases which we have had of this disease since our session has commenced, &c.

"It affords me great satisfaction in having an opportunity of rendering that justice to Mr Copland Hutchison, which some of his own countrymen have denied to him. To him we are *exclusively* indebted for this great improvement in the treatment of erysipelas. Like all great improvements, it was at first met by a denial of its utility, and then by ascribing it to some body else; but I have no hesitation in thus publicly offering my acknowledgments to him for one of the most valuable improvements which have been made in the practice of surgery within our times."—See Crampton's Clinical Lectures, as published in the London Medical and Surgical Journal, 19th of April 1834, p. 369.

John Learmonth, on the Use of Mercury.
David Low, on Fractures.
John Macdonald, De Emeticis.
Eric Mackay, on Mortification.
George M'Laren, on Caries.
William Moir, on Uterine Hemorrhage.
William B. Millar, on Indigestion.
David Morice, on the Cure of Cataract by Solution.
Philip Nelson, on the Sabulous Sediments of the Urine.
Patrick S. K. Newbigging, on the Causes of the Impulse and Sounds of the Heart.
John Paxton, on Burns.
Andrew Plummer, on Bronchitis.
Robert Purdie, De Apoplexia.
George G. Robertson, on Inguinal Hernia.
James Robb, De Pneumonitide.
Peter Russell, on the Cutting Gorget.
Charles F. Sloan, on Stricture of the Urethra.
Elliot Stavert, on Hepatitis.
Robert H. Taylor, on Removing Calculi from the Bladder.
William Thomson, on Mental Diseases.
Thomas W. Wilson, on Delirium Tremens.

Of England.

Edward F. Astley, on Synovial Membranes.
William R. Basham, on the Agency of the Atmosphere on Animal and Vegetable Life.
Robert Bell, De Febre Intermittente.
William Bullar, on Acute Pericarditis.
Francis Burridge, De Vermibus qui infestant Corpus Humanum.
William C. Callow, De Iritide.
John Cargill, on Peripneumonia.
William B. Clarke, on the Vital Principle in Animals and Vegetables.
John Davies, on the Employment of Oxide of Antimony in the Treatment of Pneumonia.
David Durran, De Abortu.
John Exley, on Puerperal Fever.
Sir James Eyre, on Pneumonia.
John S. Frowd, on Lateral Curvature of Spine.
Railton Gill, on Diseases of the Stomach.
Henry Hadley, on Inflammation of the Mucous Coat of the Intestinal Canal.
Thomas S. Harrison, on Urinary Calculi.
William Hawkins, on Germination of Seeds.
William F. Hunter, on Varieties of the Human Species.
George Livingston, on Epilepsy.
John Matheson, on Insanity.
Thomas A. Nelson, on Phthisis Pulmonalis.
John S. Newhold, on the Nature and Properties of the Blood.
Henry H. Parkin, on Cholera.
Ralph Richardson, on Proximate Causes of Asthma.
John Rogerson, on Obstruction of the Liver.
Thomas Rowley, on Gout.
Edward J. Scott, on the Varieties of the Human Species.
Charles S. Smith, on Rheumatism.
James Titley, on Apoplexy.
Robert W. Thacker, on Pleuritide.
Henry Tyser, on Paralysis.
Wm. M. Underwood, on Erysipelas.
Robert Verity, De Membranarum consensibus.
George Wharton, on Asthma.
George Wilson, De Cynanche Tracheali.

Of Ireland.

George T. Beilby, on Polypous Tumours.
Henry Brown, on Hydrocele.
Ebenezer N. Bolton, on Apoplexy.
Dionysius Colahan, on Inflammation of the Mucous Membrane of Stomach and Bowels.
Samuel Dean, De Hydrophobia.
Hercules Elmore, on Stricture of Urethra.
John Hamilton, on Bronchitis.
William Hay, on Pneumonia.
Francis Healy, on Scrofula.
David Jamieson, on Inguinal Hernia.
Joseph A. Lawson, on Callus.
William Lloyd, on Peritonitis.
George Martin, on Peripneumony.
Robert Marshall, on Tetanus.
James R. M'Cord, on Hydrocephalus.
Richard Mollan, on Dropsy.
William C. Murphy, on Apoplexy.
John Nalty, De Membranis Mucosis.
David Quill, on Apoplexy.

Charles W. Riggs, De Erysipelate.
Patrick Roe, on the Influence of Age on the Human Constitution.
Thomas Rossiter, on Jaundice.
John R. Young, on Mortification.

Of Guernsey.

William P. Monck, on the Medical Uses of the Secale cornutum.

Of Portugal.

Edward A. Robertson, on Enteritis.

Of the West Indies.

William King, on Erysipelas.

Of Barbadoes.

William C. Trotman, on Metastasis.

Of Brazil.

L. De Carvalho P. D'Andrade, on Dysentery.

Of Canada.

Arch. Hall, on the Respiratory Function of Plants.

Surgeon's Hall, Edinburgh, 1st September 1834.—*Since 31st August* 1833, the following gentlemen have offered themselves as Candidates for the *Diploma of the Royal College of Surgeons of Edinburgh,* and after producing satisfactory evidence that they had completed the course of study prescribed by the College, have been admitted to examination, and found fully qualified to practice the arts of *Anatomy, Surgery, and Pharmacy,* and have received Diplomas accordingly.

Scotland.

John Paxton,
George Smith Scott,
Robert Harthill,
George Thomson,
Robert Macdowall
William Troup,
J. T. Richardson,
James Dawson,
Thomas J. Wilkinson,
John Stewart,
Robert S. Templeton,
George G. Robertson,
James Watson,
Alexander Keiller,
Samuel D. Milligan,
William Constable,
William Glen,
Archibald F. Stevenson,
William Thomson,
John Paxton,
George Carfrae Hope,
Thomas Williamson,
Dunbar White,
Thomas Bell,
Charles Hay Carnegy.
John Learmonth,
John Campbell,
John Thomson Telfer,
James Glen,
John Campbell Brown,
Thomas Tait,
William Sutherland,
Walter Ainslie,
Andrew Shield,
Alexander Blair Spence,
James T. O. Johnston,
George Beath,
William M'Caw,
Robert Aitken,
Edward Tait,
George Hoggan Smith,
Robert Grigor.
Alexander Riddel,
Robert H. Wight,
William Carson,
Robert Lawson,
John Tervat Louthean,
Charles Durie,
Adam Drysdale,
Francis William Innes,
Alexander Bremner,
David Murray,
Robert Meikle,
Robert M'Lachlan
Archibald Brown,
John Grigor,
Charles Dawson,
John Munro,
David Low,
Alexander Straton,
John Thomson,
William Muir Andrew,
John Middlemas,
Alexander J. Pilmor,
Charles Irving,
Eric Mackay,
James Robb,
Francis Sharp,
Peter Finlayson,
William W. Johnston,
Samuel Foster,
James Morison,
John Laurie,
John Sinclair,
Robert Gillespie,
Neil Smith,
Robert Clark,
William C. Smith,
James Ross,
James Gillan,
George Macdiarmid,
Isaac Cowie,
James Aitchison,
George Cowan,
Adam Dickson,
Henry Macfarlane,
George M'Laren,
John Bower,
Robert C. Hope,
Samuel Marjoribanks,
Alex. Elliot Campbell,
William Young,
William Purdie,
Robert Flockhart,
Robert H. Taylor,
James Douglas,
John Arnott,
William Prophit,
Robert John Gunn,
George Dodgson,
James Inglis,
William Wood,
Alexander King,
Donald M. M'Ewan,
James Hannay,
Andrew Mackie,
James Crawford,
John Armstrong,
John Deas,
James Anderson,
James Francis Cullen,
John Gillespie,
William Menzies,

England.

Edward Bowman,
John Moss Kirkman,
Edward F. Astley,
Henry Hadley,
Robert Oldham,
C. Spelman Smyth,
Frederick Snaith,
Richard Deakin,
John Mathison,
William Brewer,
John Hayton,
Henry Hunt,
John S. Sutherland,
Rowland John Traill,
John Bond,
Frederick Row,
John Callan,
Robert Wright,
Robert Wood Thacker,
George Carr,
James Tunstall,
James Andrew,
George Jameson,
George Livingston,
Thomas Heywood,
Henry Hase,
Thomas Cole,
William Terrewest,
John Pate,
John Currie,
John Davies,
John Johnson,
Robert Bell,
William E. Hunter,

Ireland.

Joseph Enright,
David Hervey,
Samuel Bennet,
Richard Day,
William Adams,
James Gogarty,
Edward Paoli Drew,
Samuel Bryson,
Donat O'Loghlen,
Thomas Allen,
Alexander Leigh,
Hercules Elmore,
William Daniel Moore,
George T. Beilby,
William Lloyd,
William M'Caskill,
William Hay,
David Jamieson,
John M'Divitt,

Abroad.

Keith M. Scott,
Alex. W. Littlepage,
William King,
Stephen C. Sewell,
Archibald Hall,
William G. Prichard,
Edward Q. Sewell,
William Hallowell,
Edward A. Robertson,
David D. Manson,
Alexander Macdonald,
William Carter,
Joseph Adams,
Aaron Hart David,
William C. Trotman.

Extracted from the Records of the Royal College by
WM. SCOTT, *Sec.*

We have received the Prospectus of a Cyclopædia of Anatomy and Physiology, which will shortly appear in London; edited by Dr R. B. Todd and Dr R. E. Grant. We can best inform our readers as to the plan of the work, by adopting the words of the Editors themselves.

"The design of the Editors in the above work is, to present the public with a complete system of Human Anatomy, Comparative Anatomy, Morbid Anatomy, and Physiology.

"They have secured the assistance of able and distinguished writers in Great Britain and Ireland, and in France.

"The Cyclopædia will consist of a series of essays on all topics connected with the sciences already mentioned. Each article will be authenticated by the signature of its author; wood-cuts and illustrative diagrams will be introduced, and a select bibliography will be appended to most of the articles."

We shall merely add, that the Editors have adopted the most likely method to insure the merits, and consequently the success of this work, by securing the aid of contributors so eminent as the Edwards's, Dutrochet, Audouin, Geoffroy St-Hilaire, and Breschet in France; Bostock, Bell, Mayo, Lee, M. Hall, and Prichard in England; Alison and Thomson in Scotland; and Jacob, Harrison, Adams, and Porter in Ireland, with many others of deservedly high reputation.

We are informed, that, on the 1st of January 1835, will be published Professor Grant's Outlines of Comparative Anatomy, in one volume 8vo, with upwards of 100 wood-cuts from Drawings by Mr H. J. Townsend, engraved by Branston.

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